VnmrJ Command and Parameter Reference

Varian, Inc. NMR Systems
With VnmrJ 2.2C Software

Pub. No. 01-999346-00, Rev. B 1207

VARIAN

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Contents Overview

Notational Conventions 33
A 35
B 81
C 87
D 119
E 199
F 213
G 245
H 273
I 293
J 303
K 307
L 311
M 341
N 365
O 377
P 383
Q 461
R 463
S 499
T 577
U 597
V 603
W 619
X 641
Y 651
Z 653

Index 661

Table of Contents

Notational Conventions

A

aa Abort acquisition with error (C) 37
abort Terminate action of calling macro and all higher macros (C) 37
abortallacqs Reset acquisition computer in a drastic situation (C) 38
abortoff Terminate normal functioning of abort in a macro (C) 38
aborton Restore normal functioning of abort in a macro (C) 38
abs Find absolute value of a number (C) 38
AC1S-AC11S Autocalibration macros (M) 39
ACbackup Make backup copy of current probe file (M) 39
acct Writes records for operator login and logoff (M) 39
ACreport Print copy of probe file after autocalibration (M) 39
acos Find arc cosine of number (C) 39
acosy Automatic analysis of COSY data (C) 40
acosyold Automatic analysis of COSY data, old algorithm (C) 40
acqdisp Display message on the acquisition status line (C) 40
acqi Interactive acquisition display process (C) 40
acqmeter Open Acqmeter window (M) 42
Acqmeter Open Acqmeter window (U) 42
acqmode Acquisition mode (P) 43
acqstat Open Acquisition Status window (M) 43
Acqstat Open Acquisition Status window (U) 43
acqstatus Acquisition status (P) 44
acquire Acquire data (M) 46
actionid Current study queue node id (P) 46
activestudy Active study name (P) 47
add Add current FID to add/subtract experiment (C) 47
addi Start interactive add/subtract mode (C) 48
addnucleus Add new nucleus to existing probe file (M) 49
addpar Add selected parameters to current experiment (M) 49
addparams Add parameter to current probe file (M) 50
addprobe Create new probe directory and probe file (M) 51
adept Automatic DEPT analysis and spectrum editing (C) 51
aexppl Automatic plot of spectral expansion (M) 52
ai Select absolute-intensity mode (C) 52
aig Absolute-intensity group (P) 52
alfa Set alfa delay before acquisition (P) 53
alock Automatic lock control (P) 53
ampmode Independent control of amplifier mode (P) 54
amptype Amplifier type (P) 54
analyz Calculate standard peak height (M) 55
analyze Generalized curve fitting (C) 55
ap Print out “all” parameters (C) 57
ap “All” parameters display control (P) 57
apa Plot parameters automatically (M) 57
aph Automatic phase adjustment of spectra (C) 58
aph0 Automatic phase of zero-order term (C) 58
aphb Auto phasing for Bruker data (C) 58
aphx Perform optimized automatic phasing (M) 59
appdirs Starts Applications Directory Editor (M) 59
appmode Application mode (P) 60
apptype Application type (P) 60
Apt Set up parameters for APT experiment (M) 60
aptaph Automatic processing for APT spectra (M) 60
array Easy entry of linearly spaced array values (M) 60
array Parameter order and precedence (P) 61

arraydim Dimension of experiment (P) ... 61
asin Find arc sine of number (C) ... 62
asize Make plot resolution along f_1 and f_2 the same (M) ... 62
assign Assign transitions to experimental lines (M) ... 62
at Acquisition time (P) ... 63
atan Find arc tangent of a number (C) ... 63
atan2 Find arc tangent of two numbers (C) ... 63
atcmd Call a macro at a specified time (M) ... 63
atext Append string to current experiment text file (M) ... 64
attval Calculate pulse width (M) ... 64
atune ProTune Present (P) ... 65
au Submit experiment to acquisition and process data (M) ... 65
AuCALch3i Set up autocalibration with CH3I sample (M) ... 66
AuCALch3i1 Get autocalibration with CH_3I sample (M) ... 66
AuCALch3oh Set up autocalibration with Autotest sample (M) ... 66
AuCALch3oh1 Get autocalibration with Autotest sample (M) ... 66
Aucalibz0 Automatic Hz to DAC calibration for Z0 (M) ... 66
AuCdec Carbon decoupler calibration macro (M) ... 67
AuCgrad Carbon/proton gradient ratio calibration macro (M) ... 67
AuCobs Carbon observe calibration macro (M) ... 67
audiofilter Audio filter board type (P) ... 67
Aufindz0 Automatic adjustment of Z0 (M) ... 68
Augcal Probe gcal calibration macro (M) ... 68
Augmap Automated gradient map generation (M) ... 68
Augmapz0 Automatic lock gradient map generation and z0 calibration (M) ... 68
AuHdec Proton decoupler calibration (M) ... 68
AuHobs Proton observe calibration macro (M) ... 69
Aumakegmap Auto lock gradient map generation (M) ... 69
AuNuc Get parameters for a given nucleus (M) ... 69
auto Prepare for an automation run (C) ... 69
auto Automation mode active (P) ... 69
auto_au Controlling macro for automation (M) ... 70
Autobackup Back up current probe file (M) ... 70
autodept Automated complete analysis of DEPT data (M) ... 70
autodir Automation directory absolute path (P) ... 71
autogo Start automation run (C) ... 71
autolist Set up and start chained acquisition (M) ... 71
autoname Create path for data storage (C) ... 72
autoname Prefix for automation data file (P) ... 74
autora Resume suspended automation run (C) ... 75
autosa Suspend current automation run (C) ... 75
autoscale Resume autoscaling after limits set by scalelimits macro (M) ... 75
autostack Automatic stacking for processing and plotting arrays (M) ... 75
autotest Open Auto Test Window (C) ... 76
autotime Displays approximate time for automation (M) ... 76
av Set abs. value mode in directly detected dimension (C) ... 76
av1 Set abs. value mode in 1st indirectly detected dimension (C) ... 77
av2 Set abs. value mode in 2nd indirectly detected dimension (C) ... 77
averag Calculate average and standard deviation of input (C) ... 77
awc Additive weighting const. in directly detected dimension (P) ... 78
awc1 Additive weighting const. in 1st indirectly detected dimension (P) . 78
awc2 Additive weighting const. in 2nd indirectly detected dimension (P) 78
axis Provide axis labels and scaling factors (C) ... 78
axis Axis label for displays and plots (P) ... 79
axisf Axis label for FID displays and plots (P) ... 80

B

bandinfo Shaped pulse information for calibration (M) ... 81
banner Display message with large characters (C) ... 81
bc 1D and 2D baseline correction (C) ... 82
beepoff Turn beeper off (C) ... 83

beepon Turn beeper on (C) ... 83
bigendian Determine system byte order (C) ... 83
binom Set up parameters for BINOM pulse sequence (M) ... 84
bioref Bio-NMR Referencing (P) ... 84
bootup Macro executed automatically (M) ... 84
box Draw a box on a plotter or graphics display (C) ... 84
boxes Draw boxes selected by the mark command (M) ... 85
bpa Plot boxed parameters (M) ... 86
br24 Set up parameters for BR24 pulse sequence (M) ... 86
bs Block size (P) ... 86

C

c13 Automated carbon acquisition (M) ... 89
c13p Process 1D carbon spectra (M) ... 89
calcdim Calculate dimension of experiment (C) ... 89
calfa Recalculate alfa so that first-order phase is zero (M) ... 90
calibflag Correct systematic errors in DOSY experiments (P) ... 90
calibrate Start a dialog for autocalibration routines (M) ... 90
callacq Utility macro to call Acq command (M) ... 90
capt Automated carbon and APT acquisition (M) ... 91
Carbon Set up parameters for 13C experiment (M) ... 91
cat Display one or more text files in text window (C) ... 91
cattn Coarse attenuator type (P) ... 91
cd Change working directory (C) ... 92
cdc Cancel drift correction (C) ... 92
cdept Automated carbon and DEPT acquisition (M) ... 92
cdump Prints the current graphics screen (M) ... 93
celem Completed FID elements (P) ... 93
center Set display limits for center of screen (C) ... 93
centersw Move cursor to center of spectrum (M) ... 93
centersw1 Move cursor to center of spectrum in 1st indirect dimension (M) ... 94
centersw2 Move cursor to center of spectrum in 2nd indirect dimension (M) ... 94
cexp Create an experiment (M) ... 94
cf Current FID (P) ... 94
cfpmult Calculate first-point multiplier for 2D experiments (M) ... 95
change Submit a change sample experiment to acquisition (M) ... 95
checkstring Find and replace unwanted characters (C) ... 95
chiliConf Control flag set by ecc_on and ecc_off (P) ... 96
Cigar2j3j Convert the parameter to a CIGAR2j3j experiment (M) ... 96
cla Clear all line assignments (M) ... 96
cla Calculated transition number (P) ... 96
clamp Calculated transition amplitude (P) ... 97
cleanexp Remove old files and directories from an experiment (M) ... 97
clear Clear a window (C) ... 97
cleardosy Delete temporarily saved data in current sub experiment (M) ... 97
clfreq Calculated transition frequency (P) ... 98
clindex Index of experimental frequency of a transition (P) ... 98
clradd Clear add/subtract experiment (C) ... 98
color Select plotting colors from a graphical interface (M) ... 98
combiplate View a color map for visual analysis of VAST microtiter plate (U) ... 98
combishow Display regions (red, green, and blue) in CombiPlate window (M) ... 98
compressfid Compress double-precision FID data (M,U) ... 99
config Display current configuration and possibly change it (M) ... 99
confirm Confirm message using the mouse (C) ... 103
Console System console type (P) ... 103
contact_time MAS cross-polarization spin-lock contact time (M) ... 103
continueMovie Continue movie in either forward or backward direction (C) ... 103
convert Convert data set from a VXR-style system (M,U) ... 104
convertbru Convert Bruker data (M,U) ... 104
copy Copy a file (C) ... 107
cos Find cosine value of an angle (C) ... 107

Cosy Convert the parameter to a COSY experiment (M) 107
cosyps Set up parameters for phase-sensitive COSY pulse sequence (M). 107
cp Copy a file (C) 108
cp Cycle phase (P) 108
cpmgt2 Set up parameters for CPMGT2 pulse sequence (M) 108
cpos_cvt Convert data set from a VXR-style system (M,U) 108
cptmp Copy experiment data into experiment subfile (M) 109
cpx Create pbox shape file (M) 109
cqexp Load experiment from protocol (M) 109
cqfindz0 Run an experiment to find the value of z0 (M) 110
cqgmap Perform gradient shimming utility functions (M) 110
cqinit Initialize liquids study queue (M) 110
cqpars Create study queue parameters for liquids (M) 110
cqplot Macro to perform generic 2D plot (M) 110
cqprotocol Macro to create protocols (M) 110
cqreset Reset study queue parameters (M) 111
cqsavestudy Macro to save study queue parameters (M) 111
cqwtmenu Macro to set weighting functions from a panel (M) 111
cr Cursor position in directly detected dimension (P) 111
cr1 Cursor position in 1st indirectly detected dimension (P) 111
cr2 Cursor position in 2nd indirectly detected dimension (P) 112
crcom Create user macro without using text editor (M) 112
create Create new parameter in a parameter tree (C) 112
createqcomp Create qcomp parameter (M) 113
crf Current time-domain cursor position (P) 113
crl Clear reference line in directly detected dimension (M) 114
crl1 Clear reference line in 1st indirectly detected dimension (M) 114
crl2 Clear reference line in 2nd indirectly detected dimension (M) 114
crmode Current state of the cursors in df, ds, or dconi programs (P) 114
crof2 Recalculate rof2 so that lp = 0 (M) 115
cryo_noisetest Run Cold Probe conditioning experiments (M) 115
cryoclient Start the CryoBay Monitor program (M, U) 115
ct Completed transients (P) 115
ctext Clear the text of the current experiment (C) 115
curexp Current experiment directory (P) 116
curscan Scan currently in progress (P) 116
curwin Current window (P) 116
cutoff Data truncation limit (P) 116
cyclenoe Set up parameters for CYCLENOE pulse sequence (M) 117
cylbr24 Set up parameters for cycled BR24 pulse sequence (M) 117
cylmrev Set up parameters for cycled MREV8 pulse sequence (M) 117
cz Clear integral reset points (C) 117

D

d0 Overhead delay between FIDs (P) 123
d1 First delay (P) 124
d2 Incremented delay in 1st indirectly detected dimension (P) 124
d2pul Set up parameters for D2PUL pulse sequence (M) 124
d3 Incremented delay for 2nd indirectly detected dimension (P) 124
d4 Incremented delay for 3rd indirectly detected dimension (P) 125
DAC_to_G Store gradient calibration value in DOSY sequences (P) 125
da Display acquisition parameter arrays (C) 125
daslp Increment for t1 dependent first-order phase correction (P) 126
date Date (P) 126
daxis Display horizontal LC axis (M) 126
Dbppste Set up parameters for Dbppste pulse sequence (M) 126
Dbppsteinept Set up parameters for Dbppsteinept pulse sequence (M) 127
dbsetup Set up VnmrJ database (U) 127
dbupdate Update the VnmrJ database (U) 127
dc Calculate spectral drift correction (C) 128
dc2d Apply drift correction to 2D spectra (C) 128

dcg Drift correction group (P) 128
dcon Display noninteractive color intensity map (C) 128
dconi Interactive 2D data display (C) 129
dconi Control display selection for the dconi program (P) 131
dconn Display color intensity map without screen erase (C) 132
dcrmv Remove dc offsets from FIDs in special cases (P) 132
ddf Display data file in current experiment (C) 132
ddff Display FID file in current experiment (C) 132
ddfp Display phase file in current experiment (C) 133
ddif Synthesize and show DOSY plot (C) 133
ddrcr Direct digital receiver coefficient ratio (P) 133
ddrpm Set ddr precession mode (P) 134
ddrtc Set ddr time constant (P) 134
dds Default display (M) 134
dds_*seqfil* Sequence-specific default display (M) 135
debug Trace order of macro and command execution (C) 135
decasynctype Select the type of decoupler asynchronous mode (P) 135
deccwarnings Control reporting of DECC warnings from PSG (P) 136
decomp Decompose a VXR-style directory (M) 136
def_osfilt Default value of osfilt parameter (P) 136
defaultdir Default directory for Files menu system (P) 136
delcom Delete a user macro (M) 137
delete Delete a file, parameter directory, or FID directory (C) 137
delexp Delete an experiment (M) 137
deletenucleus Removes nucleus entry from current probe file (M) 138
dels Delete spectra from T_1 or T_2 analysis (C) 138
delta Cursor difference in directly detected dimension (P) 138
delta1 Cursor difference in 1st indirectly detected dimension (P) 139
delta2 Cursor difference in 2nd indirectly detected dimension (P) 139
deltaf Difference of two time-domain cursors (P) 139
Dept Set up parameters for DEPT experiment (M) 139
deptgl Set up parameters for DEPTGL pulse sequence (M) 139
deptproc Process array of DEPT spectra (M) 140
destroy Destroy a parameter (C) 140
destroygroup Destroy parameters of a group in a tree (C) 140
df Display a single FID (C) 141
df2d Display FIDs of 2D experiment (C) 141
dfid Display a single FID (C) 142
dfmode Current state of display of imaginary part of a FID (P) 142
dfrq Transmitter frequency of first decoupler (P) 142
dfrq2 Transmitter frequency of second decoupler (P) 142
dfrq3 Transmitter frequency of third decoupler (P) 142
dfrq4 Transmitter frequency of fourth decoupler (P) 143
dfs Display stacked FIDs (C) 143
dfsa Display stacked FIDs automatically (C) 144
dfsan Display stacked FIDs automatically without screen erase (C) 144
dfsh Display stacked FIDs horizontally (C) 144
dfshn Display stacked FIDs horizontally without screen erase (C) 145
dfsn Display stacked FIDs without screen erase (C) 145
dfww Display FIDs in whitewash mode (C) 145
dg Display group of acquisition/processing parameters (C) 145
dg Control dg parameter group display (P) 146
dg1 Display group of display parameters (M) 146
dg1 Control dg1 parameter group display (P) 146
dg2 Display group of 3rd and 4th rf channel/3D parameters (M) 146
dg2 Control dg2 parameter group display (P) 147
dga Display group of spin simulation parameters (M) 147
DgcsteSL Set up parameters for DgcsteSL pulse sequence (M) 147
Dgcstecosy Set up parameters for Dgcstecosy pulse sequence (M) 147
Dgcstehmqc Set up parameters for Dgcstehmqc pulse sequence (M) 147
dglc Display group of LC-NMR parameters (M) 148
dglc Control dglc parameter group display (P) 148

dglp Display group of linear prediction parameters (C) 148
dgs Display group of shims and automation parameters (M) 148
dgs Control dgs parameter group display (P) 148
dhp Decoupler high-power control with class C amplifier (P) 149
dialog Display a dialog box from a macro (C) 149
diffparams Report differences between two parameter sets (U) 149
diffshims Compare two sets of shims (M,U) 150
digfilt Write digitally filtered FIDs to another experiment (M) 150
dir List files in directory (C) 150
display Display parameters and their attributes (C) 151
dla Display spin simulation parameter arrays (M) 151
dlalong Long display of spin simulation parameter arrays (C) 152
dli Display list of integrals (C) 152
dlivast Produce text file and process wells (M) 152
dll Display listed line frequencies and intensities (C) 153
dlni Display list of normalized integrals (M) 153
dlp Decoupler low-power control with class C amplifier (P) 154
dm Decoupler mode for first decoupler (P) 154
dm2 Decoupler mode for second decoupler (P) 154
dm3 Decoupler mode for third decoupler (P) 155
dm4 Decoupler mode for fourth decoupler (P) 155
dmf Decoupler modulation frequency for first decoupler (P) 155
dmf2 Decoupler modulation frequency for second decoupler (P) 156
dmf3 Decoupler modulation frequency for third decoupler (P) 156
dmf4 Decoupler modulation frequency for fourth decoupler (P) 156
dmfadj Adjust tip-angle resolution time for first decoupler (M) 157
dmf2adj Adjust tip-angle resolution time for second decoupler (M) 157
dmf3adj Adjust tip-angle resolution time for third decoupler (M) 157
dmf4adj Adjust tip-angle resolution time for fourth decoupler (M) 158
dmg Data display mode in directly detected dimension (P) 158
dmg1 Data display mode in 1st indirectly detected dimension (P) 159
dmg2 Data display mode in 2nd indirectly detected dimension (P) 159
dmgf Absolute-value display of FID data or spectrum in acqi (P) 159
dmm Decoupler modulation mode for first decoupler (P) 160
dmm2 Decoupler modulation mode for second decoupler (P) 160
dmm3 Decoupler modulation mode for third decoupler (P) 161
dmm4 Decoupler modulation mode for fourth decoupler (P) 161
dn Nucleus for first decoupler (P) 161
dn2 Nucleus for second decoupler (P) 162
dn3 Nucleus for third decoupler (P) 162
dn4 Nucleus for fourth decoupler (P) 162
dndfid Retrieve and process fid data from the locator (M) 163
dndjoin Join a work space from the locator (M) 163
dndpar Retrieve a parameter set from the locator (M) 163
dndshims Retrieve a shimset set from the locator (M) 163
dnode Display list of valid limNET nodes (M,U) 164
doautodialog Start a dialog window using `def` file (M) 164
dodialog Start a dialog window with `dialoglib` file (M) 164
dof Frequency offset for first decoupler (P) 164
dof2 Frequency offset for second decoupler (P) 164
dof3 Frequency offset for third decoupler (P) 165
dof4 Frequency offset for fourth decoupler (P) 165
Doneshot Set up parameters for Doneshot pulse sequence (M) 165
dopardialog Start a dialog with `dialoglib/experiment def` file (M) 165
do_pcss Calculate proton chemical shifts spectrum (C) 165
dosy Process DOSY experiments (M) 166
dosy2d Apptype macro for dosy 2D experiments (M) 166
dosyfrq Larmor frequency of phase encoded nucleus in DOSY (P) 166
dosygamma Gyromagnetic constant of phase encoded nucleus in DOSY (P) ... 167
dosytimecubed Gyromagnetic constant of phase encoded nucleus in DOSY (P) ... 167
dot1 Set up a T_1 experiment (M) 167
dotflag Display FID as connected dots (P) 167

downsamp Downsampling factor applied after digital filtering (P) 168
dp Double precision (P) 168
dpcon Display plotted contours (C) 168
dpconn Display plotted contours without screen erase (C) 169
dpf Display peak frequencies over spectrum (C) 169
dpir Display integral amplitudes below spectrum (C) 170
dpirn Display normalized integral amplitudes below spectrum (M) 170
dpiv Display integral values below spectrum (M) 170
dpivn Display normalized integral values below spectrum (M) 171
dpl Default plot (M) 171
dpl_*seqfil* Sequence-specific default plot (M) 171
dplane Display a 3D plane (M) 172
dpr Default process (M) 172
dpr_*seqfil* Sequence-specific default process (M) 172
dprofile Display pulse excitation profile (M) 172
dproj Display a 3D plane projection (M) 173
dps Display pulse sequence (C) 173
dpwr Power level for first decoupler with linear amplifier (P) 174
dpwr2 Power level for second decoupler with linear amplifier (P) 174
dpwr3 Power level for third decoupler with linear amplifier (P) 175
dpwr4 Power level for fourth decoupler amplifier (P) 175
dpwrf First decoupler fine power (P) 176
dpwrf2 Second decoupler fine power (P) 176
dpwrf3 Third decoupler fine power (P) 176
dpwrm First decoupler linear modulator power (P) 177
dpwrm2 Second decoupler linear modulator power (P) 177
dpwrm3 Third decoupler linear modulator power (P) 177
Dqcosy Convert the parameter to a DQCOSY experiment (M) 177
draw Draw line from current location to another location (C) 177
dres Measure linewidth and digital resolution (C) 178
dres Tip-angle resolution for first decoupler (P) 178
dres2 Tip-angle resolution for second decoupler (P) 179
dres3 Tip-angle resolution for third decoupler (P) 179
dres4 Tip-angle resolution for fourth decoupler (P) 179
ds Display a spectrum (C) 180
ds2d Display 2D spectra in whitewash mode (C) 181
ds2dn Display 2D spectra in whitewash mode without screen erase (C) .. 181
dsnarray Report statistical signal-to-noise for Cold Probes (M) 182
dscale Display scale below spectrum or FID (C) 182
dscoef Digital filter coefficients for downsampling (P) 182
dseq Decoupler sequence for first decoupler (P) 183
dseq2 Decoupler sequence for second decoupler (P) 183
dseq3 Decoupler sequence for third decoupler (P) 183
dseq4 Decoupler sequence for fourth decoupler (P) 184
dsfb Digital filter bandwidth for downsampling (P) 184
dshape Display pulse shape or modulation pattern (M) 184
dshapef Display last generated pulse shape (M) 184
dshapei Display pulse shape or modulation pattern interactively (M) 185
dshim Display a shim “method” string (M) 185
dslsfrq Bandpass filter offset for downsampling (P) 185
dsn Measure signal-to-noise (C) 186
dsnmax Calculate maximum signal-to-noise (M) 186
dsp Display calculated spectrum (C) 187
dsp Type of DSP for data acquisition (P) 188
dsplanes Display a series of 3D planes (M) 189
dsptype Type of DSP (P) 189
dss Display stacked spectra (C) 189
dssa Display stacked spectra automatically (C) 191
dssan Display stacked spectra automatically without erasing (C) 192
dssh Display stacked spectra horizontally (C) 192
dsshn Display stacked spectra horizontally without erasing (C) 194
dssl Label a display of stacked spectra (M) 194

dssn Display stacked spectra without screen erase (C) ... 195
dsvast Display VAST data in a stacked 1D-NMR matrix format (M) ... 195
dsvast2d Display VAST data in a pseudo-2D format (M) ... 196
dsww Display spectra in whitewash mode (C) ... 196
dtext Display a text file in graphics window (M) ... 196
dtrig Delay to wait for another trigger or acquire a spectrum (P) ... 197
dutyc Duty cycle for homodecoupling (optional) (P) ... 197

E

e Eject sample (M) ... 199
eaddr Display Ethernet address (M,U) ... 200
ecc_on Turns on eddy current compensation for Cold Probes (M) ... 200
ecc_off Turns off eddy current compensation for Cold Probes (M) ... 200
echo Display strings and parameter values in text window (C) ... 200
edit Edit a file with user-selectable editor (M) ... 200
eject Eject sample (M) ... 201
elist Display directory on remote VXR-style system (M,U) ... 201
email Email address (P) ... 201
enter Enter sample information for automation run (M,U) ... 202
enterdialog Start a dialog window using enterexp file (M) ... 202
eread Transfer file from remote source (M,U) ... 202
ernst Calculate the Ernst angle pulse (C) ... 203
errlog Display recent error messages (C) ... 203
errloglen Number of lines in error message display (P) ... 203
ewrite Transfer file to remote destination (M,U) ... 204
exec Execute a command (C) ... 204
execpars Set up the exec parameters (M) ... 204
execplot Execute plotting macro (P) ... 204
execprep Execute prepare macro (P) ... 205
execprescan Execute prescan macro (P) ... 205
execproc Execute processing macro (P) ... 205
execprocess Execute processing macro (P) ... 205
execsetup Execute setup macro (P) ... 205
exists Checks if parameter, file, or macro exists and file type (C ... 205
exit Call the vnmrexit command (M) ... 208
exp Find exponential value of a number (C) ... 208
expactive Determine if experiment has active acquisition (C) ... 208
expfit Make least-squares fit to polynomial or exponential curve (U) ... 209
expl Display exponential or polynomial curves (C) ... 210
expladd Add another diffusion analysis to current display (M) ... 211
explib Display experiment library (M) ... 212
explist Display current experiment chain and approx. time for each (M) ... 212
explog Display log file for experiment (M) ... 212
exptime Display experiment time (C) ... 212

F

f Set display parameters to full spectrum (C) ... 214
f19 Automated fluorine acquisition (M) ... 214
f19p Process 1D fluorine spectra (M) ... 215
f1coef Coefficient to construct F1 interferogram (P) ... 215
f2coef Coefficient to construct F2 interferogram (P) ... 216
fattn Fine attenuator (P) ... 216
fb Filter bandwidth (P) ... 216
fbc Apply baseline correction for each spectrum in an array (M) ... 217
fdm1 Set, write 1D FDM parameters, run FDM (M) ... 217
fiddc3d 3D time-domain dc correction (P) ... 218
fiddle Perform reference deconvolution (M) ... 218
fiddled Perform reference deconvolution subtracting alternate FIDs (C) ... 219
fiddleu Perform reference deconvolution subtracting successive FIDs (C) 220
fiddle2d Perform 2D reference deconvolution (C) ... 220
fiddle2D Perform 2D reference deconvolution (C) ... 220

fiddle2dd 2D reference deconvolution subtracting alternate FIDs (C) 220
fiddle2Dd 2D reference deconvolution subtracting alternate FIDs (C) 220
fidmax Find the maximum point in an FID (C) 220
fidpar Add parameters for FID display in current experiment (M) 221
fidsave Save data (M) 221
fifolpsize FIFO loop size (P) 221
file File name of parameter set (P) 221
files Interactively handle files (C) 221
filesinfo Return file information for files display (C) 222
filtfile File of FIR digital filter coefficients (P) 222
findxmlmenu Find an xml menu (M) 223
fitspec Perform spectrum deconvolution (C, U) 223
fixgrd Convert gauss/cm value to DAC (M) 224
fixpar Correct parameter characteristics in experiment (M) 224
fixpar3rf Create parameters for third rf channel (M) 224
fixpar4rf Create parameters for fourth rf channel (M) 224
fixpar5rf Create parameters for fifth rf channel (M) 225
fixup Adjust parameter values selected by setup macros (M) 225
fixpsg Update psg libraries (M) 225
flashc Convert compressed 2D data to standard 2D format (C) 225
flipflop Set up parameters for FLIPFLOP pulse sequence (M) 226
Fluorine Set up parameters for 19F experiment (M) 226
flush Write out data in memory (C) 226
fn Fourier number in directly detected dimension (P) 227
fn1 Fourier number in 1st indirectly detected dimension (P) 227
fn2 Fourier number in 2nd indirectly detected dimension (P) 227
fn2D Fourier number to build up 2D DOSY display in freq. domain (P) 227
focus Send keyboard focus to input window (C) 228
foldcc Fold INADEQUATE data about two-quantum axis (C) 228
foldj Fold J-resolved 2D spectrum about f_1=0 axis (C) 228
foldt Fold COSY-like spectrum along diagonal axis (C) 228
fontselect Open FontSelect window (C) 229
format Format a real number or convert a string for output (C) 229
fp Find peak heights or phases (C) 230
fpmult First point multiplier for np FID data (P) 230
fpmult1 First point multiplier for ni interferogram data (P) 231
fpmult2 First point multiplier for ni2 interferogram data (P) 231
fr Full recall of a display parameter set (M) 231
fread Read parameters from file and load them into a tree (C) 231
fsave Save parameters from a tree to a file (C) 232
fsq Frequency-shifted quadrature detection (P) 232
ft Fourier transform 1D data (C) 233
ft1d Fourier transform along f_2 dimension (C) 234
ft1da Fourier transform phase-sensitive data (M) 235
ft1dac Combine arrayed 2D FID matrices (M) 236
ft2d Fourier transform 2D data (C) 236
ft2da Fourier transform phase-sensitive data (M) 239
ft2dac Combine arrayed 2D FID matrices (M) 240
ft3d Perform a 3D Fourier transform on a 3D FID data set (M,U) 240
full Set display limits for a full screen (C) 244
fullsq Display largest square 2D display (M) 244
fullt Set display limits for a full screen with room for traces (C) 244

G

g2pul_ecc Setup macro for eddy current compensation parameters (M) 246
ga Submit experiment to acquisition and FT the result (M) 247
gain Receiver gain (P) 247
gap Find gap in the current spectrum (M) 248
gaussian Set up unshifted Gaussian window function (M) 248
gcal Gradient calibration constant (P) 249
gcoil Current gradient coil (P) 249

Gcosy Convert the parameter to a gradient COSY experiment (M) 250
gdiff Diffusion gradient level (P) 250
Gdqcosy Convert the parameter to a gradient DQCOSY experiment (M) 250
get1d Select a 1D experiment for processing (M) 250
get2d Select a 2D experiment for processing (M) 251
getdim Return dimensionality of experiment (M) 251
getfile Get information about directories and files (C) 251
getlimit get the limits of a variable in a tree (C) 252
getll Get intensity and line frequency of line (C) 252
getparam Retrieve parameter from probe file (M) 253
getplane Extract planes from a 3D spectral data set (M) 253
getreg Get frequency limits of a specified region (C) 254
getsn Get signal-to-noise estimate of a spectrum (M)..... 254
gettoken Utility macro to separate a string into tokens (M) 255
gettxt Get text file from VnmrJ data file (C) 255
gettype Get the type of a variable (C)..... 255
getvalue Get value of parameter in a tree (C) 256
gf Prepare parameters for FID/spectrum display in acqi (M) 256
gf Gaussian function in directly detected dimension (P) 257
gf1 Gaussian function in 1st indirectly detected dimension (P) 257
gf2 Gaussian function in 2nd indirectly detected dimension (P) 257
gflow Flow encoding gradient level (P)..... 257
gfs Gaussian shift const. in directly detected dimension (P) 257
gfs1 Gaussian shift const. in 1st indirectly detected dimension (P) 258
gfs2 Gaussian shift const. in 2nd indirectly detected dimension (P)..... 258
Ghmbc Convert the parameter to a gradient HMBC experiment (M)..... 258
ghmqc Set up a PFG HMQC pulse sequence (M)..... 258
Ghmqc Convert the parameter to a gradient HMQC experiment (M) 258
gHMQC15 Set up parameters for ^{15}N gHMQC experiment (M)..... 259
gHMQC_d2 Set up parameters for ^{15}N gHMQC experiment using dec. 2 (M).. 259
gHMQC_d213 Set up parameters for ^{13}C gHMQC experiment using dec. 2 (M).. 259
ghmqcps Set up a PFG HMQC phase-sensitive pulse sequence (M) 259
ghsqc Set up a PFG HSQC pulse sequence (M) 259
Ghsqc Convert the parameter to a gradient HSQC experiment (M)..... 259
gHSQC15 Set up parameters for ^{15}N gHSQC experiment (M) 259
gHSQC_d2 Set up parameters for ^{15}N gHSQC experiment using dec. 2 (M)... 259
gHSQC_d213 Set up parameters for ^{13}C gHSQC experiment using dec. 2 (M)... 259
Ghsqctoxy Convert parameters for gradient HSQCTOXY experiment (M) 259
gilson Open the Gilson Liquid Handler window (C) 260
gin Return current mouse position and button values (C) 260
globalauto Automation directory name (P) 260
glue Create a pseudo-2D dataset (M) 261
gmapshim Start gradient autoshimming (M)..... 261
gmapshim_au Start acquisition with gradient shimming (M)..... 261
gmapspin Enable or disable spinning during gradient shimming (P) 261
gmapsys Run gradient autoshimming, set parameters, map shims (M) 262
gmapz Get parameters and files for gmapz pulse sequence (M)..... 263
gmap_findtof Gradient shimming flag to first find tof (P)..... 263
gmap_z1z4 Gradient shimming flag to first shim z1-z4 (P) 263
gmax Maximum gradient strength (P)..... 264
gmqcosy Set up PFG absolute-value MQF COSY parameter set (M)..... 264
gnoesy Set up a PFG NOESY parameter set (M) 264
go Submit experiment to acquisition (M)..... 264
go_ Pulse sequence setup macro called by go, ga, and au (M)..... 265
gpat-gpat3 Gradient shape (P) 266
gplan Start interactive image planning (C)..... 266
gradientdisable Disable PFG gradients (P) 266
gradientshaping Activate shaping on the gradient pulses (P)..... 266
gradstepsz Gradient step size (P)..... 266
gradtype Gradients for X, Y, and Z axes (P)..... 267
graphis Return the current graphics display status (C)..... 267
grayctr Gray level window adjustment (P) 268

graysl Gray level slope (contrast) adjustment (P) 268
grecovery Eddy current testing (M) 268
grid Draw a grid on a 2D display (M) 268
groupcopy Copy parameters of group from one tree to another (C) 269
gspoil Spoiler gradient level (P) 269
gsspat Slice-select gradient shape (P) 269
gtnnoesy Set up a PFG TNNOESY parameter set (M) 269
gtnroesy Set up a PFG absolute-value ROESY parameter set (M) 270
gtotlimit Gradient total limit (P) 270
gtrim Trim gradient level (P) 270
gxmax,gymax,gzmax Maximum gradient strength for each axis (P) 270
gzlvl Pulsed field gradient strength (P) 270
gzsize Number of z-axis shims used by gradient shimming (P) 270
gzwin Spectral width percentage used for gradient shimming (P) 271

H

h1 Automated proton acquisition (M) 274
h1freq Proton frequency of spectrometer (P) 275
h1p Process 1D proton spectra (M) 275
h2cal Calculate strength of the decoupler field (C) 275
halt Abort acquisition with no error (C) 276
hc Automated proton and carbon acquisition (M) 276
hcapt Automated proton, carbon, and APT acquisition (M) 277
hcchtocsy Set up parameters for HCCHTOCSY pulse sequence (M) 277
hccorr Automated proton, carbon, and HETCOR acquisition (M) 277
hcdept Automated proton, carbon, and DEPT acquisition (M) 277
hcosy Automated proton and COSY acquisition (M) 278
hdmf Modulation frequency for homonuclear decoupling (P) 278
hcmult Execute protocol actions of apptype hcmult (M) 278
hdof Frequency offset for homodecoupling (P) 279
hdpwr Power level for homodecoupling (P) 279
hdpwrf Homodecoupling fine power (optional) (P) 280
hdres Sets the tip angle resolution (P) 280
hdseq Waveform filename for band selective decoupling (P) 281
hdwshim Hardware shimming (P) 281
hdwshimlist List of shims for hardware shimming (P) 281
het2dj Set up parameters for HET2DJ pulse sequence (M) 282
HETCOR Change parameters for HETCOR experiment (M) 282
hetcor Set up parameters for HETCOR pulse sequence (M) 282
hetcorcp1 Set up parameters for solids HETCOR pulse sequence (M) 282
hetcorps Set up parameters for HETCORPS pulse sequence (M) 282
hetero2d Execute protocol actions of apptype hetero2d (M) 282
hidecommand Execute macro instead of command with same name (C) 283
hipwrampenable High Power Amplifier Enable (P) 283
Hmbc Convert the parameter to a HMBC experiment (M) 283
Hmqc Convert the parameter to a HMQC experiment (M) 283
HMQC15 Set up parameters for ^{15}N HMQC experiment (M) 283
HMQC_d2 Set up parameters for ^{15}N HMQC experiment using dec. 2 (M) 284
HMQC_d213 Set up parameters for ^{13}C HMQC experiment using dec. 2 (M) 284
hmqcr Set up parameters for HMQCR pulse sequence (M) 284
Hmqctoxy Convert the parameter to a HMQCTOXY experiment (M) 284
HMQCTOXY15 Set up parameters for ^{15}N HMQCTOXY experiment (M) 284
HMQCTOXY_d2 Set up parameters for ^{15}N HMQCTOXY using decoupler 2 (M) 284
HMQCTOXY_d213 Set up parameters for ^{13}C HMQCTOXY using decoupler 2 (M) 284
hmqctoxy3d Set up parameters for HMQC-TOCSY 3D pulse sequence (M) 284
ho Horizontal offset (P) 284
hom2dj Set up parameters for HOM2DJ pulse sequence (M) 284
homo Homodecoupling control for the observe channel (P) 285
HOMODEC Change parameters for HOMODEC experiment (M) 285
homo2d Execute protocol actions of apptype homo2d (M) 285
homorof1 Delay before turning on homo decoupling rf (P) 285

homorof2 Delay after blanking the amp and setting T/R switch to recv (P)... 286
homorof3 Delay between setting T/R to receive and gating the recvr on (P) . 286
hoult Set parameters alfa and rof2 according to Hoult (M) 287
hpa Plot parameters on special preprinted chart paper (C)..... 287
Hprescan Proton prescan (P)) 287
hregions Select integral regions in proton spectrum (M) 287
hs Homospoil pulses (P)..... 287
Hsqc Convert the parameter to a HSQC experiment (M)..... 288
HSQC15 Set up parameters for ^{15}N HSQC experiment (M) 288
HSQC_d2 Set up parameters for ^{15}N HSQC experiment using dec. 2 (M)..... 288
HSQC_d213 Set up parameters for ^{13}C HSQC experiment using dec. 2 (M)..... 288
hsqcHT Set up the hsqcHT experiment (M)..... 288
Hsqctoxy Convert parameters to a HSQCTOXY experiment (M) 288
HSQCTOXY15 Set up parameters for ^{15}N HSQCTOXY experiment (M)..... 288
HSQCTOXY_d2 Set up parameters for ^{15}N HSQCTOXY using decoupler 2 (M).... 288
HSQCTOXY_d213 Set up parameters for ^{13}C HSQCTOXY using decoupler 2 (M).... 288
hsqctoxySE Set up parameters for HSQC-TOCSY 3D pulse sequence (M)..... 289
hsrotor Display rotor speed for solids operation (P) 289
hst Homospoil time (P)..... 289
htbitrev Hadamard bit reversal flag (P)..... 289
htbw1 Hadamard pulse excitation bandwidth in ni (P)..... 289
htcal1 RF calibration flag for Hadamard waveforms in ni (P)..... 290
htfrq1 Hadamard frequency list in ni (P)..... 290
htofs1 Hadamard offset in ni (P)..... 290
htpwr1 Power level for RF calibration of Hadamard waveforms in ni (P) . 290
htss1 Stepsize for Hadamard waveforms in ni (P) 291
hzmm Scaling factor for plots (P)..... 291
hztomm Convert locations from Hz or ppm to plotter units (C)..... 291

I

i Insert sample (M)..... 293
ihwinfo Hardware status of console (U) 293
il Interleave arrayed and 2D experiments (P) 294
ilfid Interleave FIDs during data processing (C)..... 294
imagefile Display an image file (M)..... 294
imageprint Plot non interactive gray scale image (M) 295
imconi Display 2D data in interactive grayscale mode (M) 295
in Lock and spin interlock (P)..... 295
inadqt Set up parameters for INADEQUATE pulse sequence (M) 296
index2 Projection or 3D plane index selected (P) 296
inept Set up parameters for INEPT pulse sequence (M)..... 296
initialize_iterate Set iterate string to contain relevant parameters (M)..... 296
input Receive input from keyboard (C) 296
ins Integral normalization scale (P)..... 297
ins2 2D volume value (P)..... 297
insref Fourier number scaled value of an integral (P)..... 297
ins2ref Fourier number scaled volume of a peak (P)..... 297
insert Insert sample (M)..... 298
inset Display an inset spectrum (C)..... 298
integ Find largest integral in a specified region (C) 298
integrate Automatically integrate 1D spectrum (M)..... 299
intmod Integral display mode (P)..... 299
intvast Produces a text file of integral regions (M) 299
io Integral offset (P)..... 299
is Integral scale (P)..... 299
isadj Automatic integral scale adjustment (M)..... 300
isadj2 Automatic integral scale adjustment by powers of two (M)..... 300
isreal Utility macro to determine a parameter type (M)..... 300
isstring Utility macro to determine a parameter type (M)..... 301
iterate Parameters to be iterated (P)..... 302

J

jcurwin Work space numbers of all viewports (P) 303
jdesign Start Plot Designer Program (M) 303
jexp Join existing experiment (C) 303
jexp1-jexp9999 Join existing experiment and display new parameters (M) 304
jplot Plot from Plot Designer program (C) 304
jplotscale Scale plot parameters (M) 304
jplotunscale Restore current experiment parameters (M) 305
jprint Prints the selected images to a printer or file (M) 305
jumpret Set up parameters for JUMPRET pulse sequence (M) 305
jviewport Work space numbers of the current viewports (P) 305
jviewportlabel Work space labels for all viewport buttons (P) 305
jviewports Viewport layout (P) 306
jwin Activate and record activity in current window (M) 306

K

killft3d Terminate any ft3d process started in an experiment (M,U) 307
killplot Stop plot jobs and remove from plot queue (M) 307
killprint Stop print jobs and remove from print queue (M) 308
kind Kinetics analysis, decreasing intensity (M) 308
kinds Kinetics analysis, decreasing intensity, short form (M) 308
kini Kinetics analysis, increasing intensity (M) 308
kinis Kinetics analysis, increasing intensity, short form (M) 309

L

lastlk Last lock solvent used (P) 312
lastmenu Menu to display when Return button is selected (P) 313
latch Frequency synthesizer latching (P) 313
lb Line broadening in directly detected dimension (P) 313
lb1 Line broadening in 1st indirectly detected dimension (P) 313
lb2 Line broadening in 2nd indirectly detected dimension (P) 314
lc1d Pulse sequence for LC-NMR (M) 314
lcpar2d Create 2D LC-NMR acquisition parameters (M) 314
lcpeak Peak number (P) 315
lcplot Plot LC-NMR data (M) 315
lcpsgset Set up parameters for various LC-NMR pulse sequences (M) 315
lcset2d General setup for 2D LC-NMR experiments (M) 315
left Set display limits to left half of screen (C) 315
legrelay Independent control of magnet leg relay (P) 316
length Determine length of a string (C) 316
lf List files in directory (C) 316
liamp Amplitudes of integral reset points (P) 316
lifrq Frequencies of integral reset points (P) 317
liqbear Liquids Bearing Air Level (P) 317
listenoff Disable receipt of messages from send2Vnmr (M) 317
listenon Enable receipt of messages from send2Vnmr (M) 317
lkof Track changes in lock frequency (P) 317
ll2d Automatic and interactive 2D peak picking (C) 318
ll2dbackup Copy current ll2d peak file to another file (M) 321
ll2dmode Control display of peaks picked by ll2d (P) 321
llamp List of line amplitudes (P) 321
llfrq List of line frequencies (P) 321
ln Find natural logarithm of a number (C) 321
load Load status of displayed shims (P) 322
loadcolors Load colors for graphics window and plotters (M) 322
loc Location of sample in tray (P) 323
locaction Locator action (M) 323
lock Submit an Autolock experiment to acquisition (C) 323
lockacqtc Lock loop time constant during acquisition (P) 323
lockfreq Lock frequency (P) 324

lockgain Lock gain (P) 325
lockphase Lock phase (P) 325
lockpower Lock power (P) 325
locktc Lock time constant (P) 325
logate Transmitter local oscillator gate (P) 325
lookup Look up words and lines from a text file (C) 326
locprotoexec Execute a protocol from the locator (M) 328
lp First-order phase in directly detected dimension (P) 328
lp1 First-order phase in 1st indirectly detected dimension (P) 328
lp2 First-order phase in 2nd indirectly detected dimension (P) 329
lpalg LP algorithm in np dimension (P) 329
lpalg1 LP algorithm in ni dimension (P) 330
lpalg2 LP algorithm in ni2 dimension (P) 330
lpext LP data extension in np dimension (P) 330
lpext1 LP data extension in ni dimension (P) 330
lpext2 LP data extension in ni2 dimension (P) 331
lpfilt LP coefficients to calculate in np dimension (P) 331
lpfilt1 LP coefficients to calculate in ni dimension (P) 331
lpfilt2 LP coefficients to calculate in ni2 dimension (P) 331
lpnupts LP number of data points in np dimension (P) 331
lpnupts1 LP number of data points in ni dimension (P) 332
lpnupts2 LP number of data points in ni2 dimension (P) 332
lpopt LP algorithm data extension in np dimension (P) 332
lpopt1 LP algorithm data extension in ni dimension (P) 333
lpopt2 LP algorithm data extension in ni2 dimension (P) 333
lpprint LP print output for np dimension (P) 333
lpprint1 LP print output for ni dimension (P) 334
lpprint2 LP print output for ni2 dimension (P) 334
lptrace LP output spectrum in np dimension (P) 335
lptrace1 LP output spectrum in ni dimension (P) 335
lptrace2 LP output spectrum in ni2 dimension (P) 335
ls List files in directory (C) 335
lsfid Number of complex points to left-shift the np FID (P) 336
lsfid1 Number of complex points to left-shift ni interferogram (P) 336
lsfid2 Number of complex points to left-shift ni2 interferogram (P) 337
lsfrq Frequency shift of the fn spectrum (P) 337
lsfrq1 Frequency shift of the fn1 spectrum (P) 337
lsfrq2 Frequency shift of the fn2 spectrum (P) 338
lvl Zero-order baseline correction (P) 338
lvltlt Control sensitivity of lvl and tlt adjustments (P) 338

M

macro Macro name (P) 342
macrocat Display a user macro file in text window (C) 342
macrocp Copy a user macro file (C) 342
macrodir List user macro files (C) 343
macroedit Edit a macro with user-selectable editor (M) 343
macrold Load a macro into memory (C) 343
macrorm Remove a user macro (C) 344
macrosyscat Display a system macro file in text window (C) 344
macrosyscp Copy a system macro to become a user macro (C) 344
macrosysdir List system macros (C) 345
macrosysrm Remove a system macro (C) 345
macrovi Edit a user macro with the vi text editor (M) 345
make3dcoef Make a 3D coefficients file from 2D coefficients (M) 346
makedosyparams Create parameters for DOSY processing (M) 347
makefid Make a FID element using numeric text input (C) 347
makeeccglobals Create global parameters for ECC control (M) 348
makeslice Synthesize 2D projection of 3D DOSY experiment (C) 348
man Display online description of command or macro (M) 348
managedb Update user files (U) 349

manualpath Path to user's manual directory (P) ... 349
manvi Edit online description of a command or macro (M) ... 349
mapwin List of experiment numbers (P) ... 349
mark Determine intensity of spectrum at a point (C) ... 349
masvt Type of variable temperature system (P) ... 351
maxattench1-4 Maximum limit for attenuator setting for rf channel 1-4 (P) ... 352
maxpen Maximum number of pens to use (P) ... 352
md Move display parameters between experiments (C) ... 352
menu Change status of menu system (C) ... 353
menuvi Edit a menu with vi text editor (M) ... 353
method Autoshim method (P) ... 353
mf Move FIDs between experiments (C) ... 354
mfblk Copy FID block (C) ... 354
mfclose Close memory map FID (C) ... 355
mfdata Move FID data (C) ... 355
mfopen Memory map open FID file (C) ... 356
mftrace Move FID trace (C) ... 356
minsw Reduce spectral width to minimum required (M) ... 357
mkdir Create new directory (C) ... 357
mlabel Menu label (P) ... 358
move Move to an absolute location to start a line (C) ... 358
movedssw Set downsampling parameters for selected spectral region (M) ... 358
moveossw Set oversampling parameters for selected spectral region (M) ... 358
movesw Move spectral window according to cursors (M) ... 359
movetof Move transmitter offset (M) ... 359
mp Move parameters between experiments (C) ... 359
mqcosy Set up parameters for MQCOSY pulse sequence (M) ... 360
mref Set referencing based on a existing spectrum of the sample (M) ... 360
mrev8 Set up parameters for MREV8 pulse sequence (M) ... 361
mrfb Set the filter bandwidths for multiple receivers (P) ... 361
mrgain Set the gain for multiple receivers (P) ... 362
mstat Display memory usage statistics (C) ... 362
mstring Menu string (P) ... 362
mtune Tune probe using swept-tune graphical display (M) ... 363
mv Move and/or rename a file (C) ... 363
mxconst Maximum scaling constant (P) ... 363

N

n1,n2,n3 Name storage for macros (P) ... 365
newmenu Select a menu without immediate activation (C) ... 366
newshm Interactively create a shim method with options (M) ... 366
nextpl Display the next 3D plane (M) ... 367
nfni Number of increments in 1st indirectly detected dimension (P) ... 367
ni2 Number of increments in 2nd indirectly detected dimension (P) ... 367
ni3 Number of increments in 3rd indirectly detected dimension (P) ... 368
niter Number of iterations (P) ... 368
nimax Maximum limit of ni (P) ... 368
nl Position cursor at the nearest line (C) ... 368
nli Find integral values (C) ... 368
nlivast Produces a text file of integral regions without a sum region (M) ... 369
nlivast2 Produces a text file with normalized integral regions (M) ... 369
nlivast3 Produces a text file with normalized integral regions (M) ... 369
nll Find line frequencies and intensities (C) ... 369
nm Select normalized intensity mode (C) ... 370
nm2d Select Automatic 2D normalization (M) ... 370
Noesy Convert the parameter to a NOESY experiment (M) ... 371
Noesy1d Convert the parameter set to a Noesy1d experiment (M) ... 371
noise Measure noise level of FID (C) ... 371
noisemult Control noise multiplier for automatic 2D processing (M) ... 372
noislm Limit noise in spectrum (M) ... 372
notebook Notebook name (P) ... 372

np Number of data points (P) ... 373
npoint Number of points for fp peak search (P) ... 373
nrecords Determine number of lines in a file (M) ... 373
nt Number of transients (P) ... 373
ntrig Number of trigger signals to wait before acquisition (P) ... 374
ntype3d Specify whether f_1 or f_2 display expected to be N-type (P) ... 374
nuctable Display VNMR style nucleus table for a given H1 frequency (M) 374
numrcvrs Number of receivers in the system (P) ... 374
numreg Return the number of regions in a spectrum (C) ... 375
numrfch Number of rf channels (P) ... 375

O

off Make a parameter inactive (C) ... 377
on Make a parameter active or test its state (C) ... 377
operator Operator name (P) ... 378
operatorlogin Sets workspace and parameters for the operator (M) ... 378
opx Open shape definition file for Pbox (M) ... 378
oscoef Digital filter coefficients for over sampling (P) ... 379
osfb Digital filter bandwidth for oversampling (P) ... 379
osfilt Oversampling filter for real-time DSP (P) ... 380
oslsfrq Bandpass filter offset for oversampling (P) ... 380
overrange Frequency synthesizer overrange (P) ... 380
oversamp Oversampling factor for acquisition (P) ... 381
owner Operating system account owner (P) ... 382

P

p1 Enter pulse width for p1 in degrees (C) ... 387
p1 First pulse width (P) ... 387
p1pat Shape of excitation pulse (P) ... 387
p2pul Set up sequence for PFG testing (M) ... 388
p31 Automated phosphorus acquisition (M) ... 388
p31p Process 1D phosphorus spectra (M) ... 388
pa Set phase angle mode in directly detected dimension (C) ... 389
pa1 Set phase angle mode in 1st indirectly detected dimension (C) ... 389
pacosy Plot automatic COSY analysis (C) ... 390
pad Preacquisition delay (P) ... 390
padept Perform adept analysis and plot resulting spectra (C) ... 391
page Submit plot and change plotter page (C) ... 391
page Name of page (P) ... 392
panellevel Display level for VnmrJ interface pages (P) ... 392
pap Plot out “all” parameters (C) ... 392
par2d Create 2D acquisition, processing, and display parameters (M) ... 393
par3d Create 3D acquisition, processing, and display parameters (M) ... 393
par3rf Get display templates for 3rd rf channel parameters (M) ... 393
par4d Create 4D acquisition parameters (M) ... 393
paramedit Edit a parameter and its attributes with user-selected editor (C) ... 394
paramvi Edit a parameter and its attributes with vi editor (M) ... 394
pards Create additional parameters used by downsampling (M) ... 395
parfidss Create parameters for time-domain solvent subtraction (M) ... 395
parfix Update parameter sets (M) ... 396
parlc Create parameters for LC-NMR experiments (M) ... 396
parll2d Create parameters for 2D peak picking (M) ... 397
parlp Create parameters for linear prediction (M) ... 397
parmax Parameter maximum values (P) ... 397
parmin Parameter minimum values (P) ... 398
paros Create additional parameters used by oversampling (M) ... 398
parstep Parameter step size values (P) ... 398
parversion Version of parameter set (P) ... 399
path3d Path to currently displayed 2D planes from a 3D data set (P) ... 399
paxis Plot horizontal LC axis (M) ... 399
Pbox Pulse shaping software (U) ... 400

pbox_bw Define excitation band (M) ... 401
pbox_bws Define excitation band for solvent suppression (notch) pulses (M) 401
pbox_dmf Extract dmf value from pbox.cal or Pbox shape file (M) ... 401
pbox_dres Extract dres value from pbox.cal or Pbox shape file (M) ... 402
pbox_name Extract name of last shape generated by Pbox from pbox.cal (M) . 402
pbox_pw Extract pulse length from pbox.cal or Pbox shape file (M) ... 402
pbox_pwr Extract power level from Pbox.cal or Pbox shape file (M) ... 402
pbox_pwrf Extract fine power level from pbox.cal or Pbox shape file (M) ... 403
pboxget Extract Pbox calibration data (M) ... 403
pboxpar Add parameter definition to the Pbox.inp file (M) ... 404
pboxrst Reset temporary Pbox variables (M) ... 404
pboxunits Converts to Pbox default units (M) ... 404
pcon Plot contours on a plotter (C) ... 404
pcss Calculate and show proton chemical shifts spectrum (M) ... 405
peak Find tallest peak in specified region (C) ... 405
peak2d Return information about maximum in 2D data (C) ... 406
pen Select a pen or color for drawing (C) ... 406
pexpl Plot exponential or polynomial curves (C) ... 407
pexpladd Add another diffusion analysis to current plot (M) ... 407
pfgon Pulsed field gradient amplifiers on/off control (P) ... 407
pfww Plot FIDs in whitewash mode (C) ... 408
pge Convert parameter set to PGE pulse sequence (M) ... 408
pge_calib Calibrate gradient strengths for PGE pulse sequence (M) ... 408
pge_data Extract data from single element of PGE pulse sequence (M) ... 409
pge_output Output results from PGE pulse sequence (M) ... 409
pge_process Automated processing of data from PGE pulse sequence (M) ... 409
pge_results Calculate diffusion constant for integral region (M) ... 409
pge_setup Set up gradient control parameters for PGE pulse sequence (M) ... 410
ph Set phased mode in directly detected dimension (C) ... 410
ph1 Set phased mode in 1st indirectly detected dimension (C) ... 411
ph2 Set phased mode in 2nd indirectly detected dimension (C) ... 411
phase Change frequency-independent phase rp (M) ... 412
phase Phase selection (P) ... 412
phase1 Phase of first pulse (P) ... 412
phase2 Phase selection for 3D acquisition (P) ... 412
phase3 Phase selection for 4D acquisition (P) ... 413
phasing Control update region during interactive phasing (P) ... 413
phfid Zero-order phasing constant for the np FID (P) ... 413
phfid1 Zero-order phasing constant for ni interferogram (P) ... 414
phfid2 Zero-order phasing constant for ni2 interferogram (P) ... 414
Phosphorus Set up parameters for ^{31}P experiment (M) ... 414
pi3ssbsq Set up pi/3 shifted sinebell-squared window function (M) ... 414
pi4ssbsq Set up pi/4 shifted sinebell-squared window function (M) ... 415
pin Pneumatics Router Interlock ((P) ... 415
pintvast Plots of integral regions (M) ... 415
pir Plot integral amplitudes below spectrum (C) ... 416
pirn Plot normalized integral amplitudes below spectrum (M) ... 416
piv Plot integral values below spectrum (M) ... 416
pivn Plot normalized integral values below spectrum (M) ... 416
pl Plot spectra (C) ... 417
pl2d Plot 2D spectra in whitewash mode (C) ... 418
plane Currently displayed 3D plane type (P) ... 418
plapt Plot APT-type spectra automatically (M) ... 419
plarray Plotting macro for arrayed 1D spectra (M) ... 419
plate_glue Define a glue order for plotting and display (U) ... 419
plc Plot a carbon spectrum (M) ... 420
plcosy Plot COSY- and NOESY-type spectra automatically (M) ... 420
pldept Plot DEPT data, edited or unedited (M) ... 421
plfid Plot FIDs (C) ... 421
plfit Plot deconvolution analysis (M) ... 422
plgrid Plot a grid on a 2D plot (M) ... 422
plh Plot proton spectrum (M) ... 422

plhet2dj Plot heteronuclear J-resolved 2D spectra automatically (M)..... 422
plhom2dj Plot homonuclear J-resolved 2D spectra automatically (M) 423
plhxcor Plot X,H-correlation 2D spectrum (M)..... 424
pll Plot a line list (M) 425
pll2d Plot results of 2D peak picking (C) 425
plockport Port number to use to lock out multiple ProTune processes (P)..... 425
plot Automatically plot spectra (M)..... 426
plot1d Plotting macro for simple (non-arrayed) 1D spectra (M) 426
plot2D Plot 2D spectra (M)..... 427
plotfile Plot to a file (M)..... 427
plothiresprep High resolution plot output preparation (M)..... 428
plotmanual Plot manually (M)..... 428
plotlogo Plots a logo (M) 428
plotpreview Creates temporary plots of the current plot output (M) 428
plotside Plot spectrum on side (M)..... 428
plotter Plotter device (P) 428
plottop Plot spectrum on top (M) 428
plottopside Plot spectrum on top and side (M)..... 429
plp Plot phosphorus spectrum (M)..... 429
plplanes Plot a series of 3D planes (M) 429
plt2Darg Plot 2D arguments (P)..... 430
pltext Plot text file (M) 430
pltmod Plotter display mode (P) 430
plvast Plot VAST data in a stacked 1D-NMR matrix format (M)..... 431
plvast2d Plot VAST data in a stacked pseudo-2D format (M) 431
plww Plot spectra in whitewash mode (C) 432
pmode Processing mode for 2D data (P) 432
poly0 Display mean of the data in regression.inp file (M) 433
pp Decoupler pulse length (P) 433
ppa Plot a parameter list in plain English (M)..... 434
ppcal Proton decoupler pulse calibration (M) 434
ppf Plot peak frequencies over spectrum (C)..... 434
pph Print pulse header (M) 435
ppmm Resolution on printers and plotters (P) 435
pprofile Plot pulse excitation profile (M)..... 435
pps Plot pulse sequence (C)..... 436
prealfa Specify a delay for longer ring down (P)..... 436
prep Run prepare acquisition macro (M) 436
Presat Set up parameters for presat ^{1}H experiment (M)..... 437
prevpl Display the previous 3D plane (M)..... 437
prescan Study queue prescan (P)..... 437
prescan_CoilTable Read or update the CoilTable File (M) 437
prescan_tn Return tn string for a given atomic number (M)..... 437
printer Printer device (P) 438
printfile Path to the print-to-file image (P) 438
printformat Format of saved-to-file image (P)..... 438
printlayout Layout of printed image (P)..... 438
printoff Stop sending text to printer and start print operation (C) 438
printon Direct text output to printer (C) 438
printregion Screen region to be printed (P) 439
printsize Size of printed image (P) 439
printsend Defines where image will print (P)..... 439
probe Probe type (P) 439
probeConnect Specify which nucleus can be acquired on each RF channel (P).... 439
Probe_edit Edit probe for specific nucleus (U)..... 440
probe_edit Edit probe for specific nucleus (M) 440
probe_protection Probe protection control (P)..... 440
proc Type of processing on np FID (P)..... 440
proc1 Type of processing on ni interferogram (P) 441
proc1d Processing macro for simple (non-arrayed) 1D spectra (M) 441
proc2 Type of processing on ni2 interferogram (P) 442
proc2d Process 2D spectra (M)..... 442

procarray Process arrayed 1D spectra (M) ... 443
process Generic automatic processing (M) ... 443
procplot Automatically process FIDs (M) ... 443
profile Set up pulse sequence for gradient calibration (M) ... 444
proj Project 2D data (C) ... 444
Proton Set up parameters for ^{1}H experiment (M) ... 445
protune Macro to start ProTune (M) ... 445
protune Shell script for start ProTune operation (U) ... 446
protunegui Macro to start ProTune in graphical user interface (M) ... 446
prune Prune extra parameters from current tree (C) ... 446
pscale Plot scale below spectrum or FID (C) ... 447
pseudo Set default parameters for pseudo-echo weighting (M) ... 447
psg Display pulse sequence generation errors (M) ... 448
psggen Compile a user PSG object library (M,U) ... 448
psgset Set up parameters for various pulse sequences (M) ... 448
psgupdateon Enable update of acquisition parameters (C) ... 448
psgupdateoff Prevent update of acquisition parameters (C) ... 449
pshape Plot pulse shape or modulation pattern (M) ... 449
pshapef Plot the last created pulse shape (M) ... 449
pshr PostScript High Resolution plotting control (P) ... 449
pslabel Pulse sequence label (P) ... 449
pslw PostScript Line Width control (P) ... 450
pssl Plot Arrayed Numbers (C) ... 450
ptext Print out a text file (M) ... 451
ptspec3d Region-selective 3D processing (P) ... 451
ptsval PTS frequency synthesizer value (P) ... 452
pulseinfo Shaped pulse information for calibration (M) ... 452
pulsetool RF pulse shape analysis (U) ... 452
purge Remove macro from memory (C) ... 453
puttxt Put text file into a data file (C) ... 453
putwave Write a wave into Pbox.inp file (M) ... 453
pw Enter pulse width pw in degrees (C) ... 454
pw Pulse width (P) ... 454
pw90 90° pulse width (P) ... 454
pwd Display current working directory (C) ... 454
pwpat Shape of refocusing pulse (P) ... 455
pwr Set power mode in directly detected dimension (C) ... 455
pwr1 Set power mode in 1st indirectly detected dimension (C) ... 455
pwr2 Set power mode in 2nd indirectly detected dimension (C) ... 456
pwsadj Adjust pulse interval time (M) ... 456
pwxcal Decoupler pulse calibration (M) ... 457
pxbss Bloch-Siegert shift correction during Pbox pulse generation (P) ... 457
pxrep Flag to set the level of Pbox reports (P) ... 457
pxset Assign Pbox calibration data to experimental parameters (M) ... 457
pxshape Generates a single-band shape file (M) ... 458
Pxsim Simulate Bloch profile for a shaped pulse (U) ... 458
Pxspy Create shape definition using Fourier coefficients (U) ... 459

Q

qcomp Longer dead time for longer ring down (P) ... 461
QKexp Set up quick experiment (M) ... 461
qtune Tune probe using swept-tune graphical tool (C) ... 461
? Display the value of an individual parameter (C) ... 462

R

r Recall display parameter set (M) ... 464
r(n) Recall some display parameters (C) ... 465
r1-r7 Real-value storage for macros (P) ... 465
ra Resume acquisition stopped with sa command (C) ... 465
rcvrwt Weighting for different receivers (P) ... 466
react Recover from error conditions during werr processing (M) ... 466

readallshims Read all shims from hardware (M) 467
readbrutape Read Bruker data files from 9-track tape (U) 467
readfile Read the contents of a text file into two parameters (C) 467
readhw Read current values of acquisition hardware (C)..... 468
readlk Read current lock level (C)..... 470
readparam Read one of more parameters from a file (C) 470
readultra Read shim coil setting for Ultra•nmr shim system (M)..... 471
real Create a real variable without a value (C) 471
recon_all Reconstruct images from 2D MRI fid data (C) 471
record Record keyboard entries as a macro (M) 473
redor1 Set up parameters for REDOR1 pulse sequence (M) 474
redosy Restore 2D DOSY display from sub experiment (M) 474
reff1 Reference f1 Indirect Dimension from Observe Dimension (M) ... 474
reff2 Reference f2 Indirect Dimension from Observe Dimension (M) ... 475
reffrq Reference frequency of reference line (P) 475
reffrq1 Reference freq. of reference line in 1st indirect dimension (P) 476
reffrq2 Reference freq. of reference line in 2nd indirect dimension (P)..... 476
refpos Position of reference frequency (P) 476
refpos1 Position of reference frequency in 1st indirect dimension (P)..... 477
refpos2 Position of reference frequency in 2nd indirect dimension (P) 477
refsource1 Center frequency in 1st indirect dimension (P) 477
refsource2 Center frequency in 2nd indirect dimension (P)..... 477
region Divide spectrum into regions (C)..... 478
relayh Set up parameters for RELAYH pulse sequence (M)..... 478
rename Move and/or rename a file (C)..... 479
reqparcheck Flag which enables/disables required parameters (P)..... 479
reqparclear Clears the parameters in required parameter list (M) 479
reqparlist List of required parameters (P) 480
reqpartest Tests whether required parameters are set (M)..... 480
resetf3 Reset parameters after a partial 3D Fourier transform (M) 481
resetplotter Reset plotter to system plotter (M) 481
resolv Set resolution enhancement parameters (M) 481
restorenuctable Calculate & store accurate nuctable for current system (M) 482
resume Resume paused acquisition queue (C)..... 482
return Terminate execution of a macro (C) 482
rev System software revision level (P) 483
revdate System software preparation date (P) 483
rfband RF band in use (P) 483
rfblk Reverse FID block (C)..... 483
rfchannel Independent control of rf channel selection (P)..... 484
rfchtype Type of rf channel (P) 485
rfdata Reverse FID data (C)..... 486
rfl Reference peak position in directly detected dimension (P)..... 487
rfl1 Reference peak position in 1st indirectly detected dimension (P).. 487
rfl2 Reference peak position in 2nd indirectly detected dimension (P) 487
rfp Reference peak frequency in directly detected dimension (P) 487
rfp1 Reference peak freq. in 1st indirectly detected dimension (P) 488
rfp2 Reference peak freq. in 2nd indirectly detected dimension (P)..... 488
rftrace Reverse FID trace (C)..... 488
rftype Type of rf generation (P)..... 489
rfwg RF waveform generator (P) 489
right Set display limits to right half of screen (C)..... 490
rights Determine an operator's specified right (C) 490
rinput Input data for a regression analysis (M) 490
rl Set reference line in directly detected dimension (M)..... 491
rl1 Set reference line in 1st indirectly detected dimension (M) 491
rl2 Set reference line in 2nd indirectly detected dimension (M)..... 492
rm Delete file (C) 492
rmdir Remove directory (C) 492
rmsAddData Add transformed data files with weighting (U)..... 493
Roesy Convert the parameter to a ROESY experiment (M) 493
Roesy1d Convert the parameter set to a Roesy1d experiment (M) 493

rof1 Receiver gating time preceding pulse (P) ... 493
rof2 Receiver gating time following pulse (P) ... 493
rof3 Receiver gating time following T/R switch (P) ... 494
rotate Rotate 2D data (C) ... 494
rotorsync Rotor synchronization (P) ... 494
rp Zero-order phase in directly detected dimension (P) ... 494
rp1 Zero-order phase in 1st indirectly detected dimension (P) ... 495
rp2 Zero-order phase in 2nd indirectly detected dimension (P) ... 495
rt Retrieve FIDs (M) ... 495
rtcmx Return Spinsight data into current experiment (C) ... 496
rtp Retrieve parameters (M) ... 496
rts Retrieve shim coil settings (C) ... 496
rttmp Retrieve experiment data from experiment subfile (M) ... 497
rtv Retrieve individual parameters (C) ... 497
rtx Retrieve parameters based on rtx rules (C) ... 498

S

s Save display parameters as a set (M) ... 503
s(n) Save display parameters (C) ... 503
s2pul Set up parameters for standard two-pulse sequence (M) ... 504
sa Stop acquisition (C) ... 504
sample Submit change sample, Autoshim experiment to acquisition (M) ... 504
samplename Sample name (P) ... 505
save Save data (M) ... 505
savefile Base file name for saving files (P) ... 505
saveglobal Save selected parameters from global tree (P) ... 505
sb Sinebell constant in directly detected dimension (P) ... 506
sb1 Sinebell constant in 1st indirectly detected dimension (P) ... 506
sb2 Sinebell constant in 2nd indirectly detected dimension (P) ... 506
sbs Sinebell shift in directly detected dimension (P) ... 506
sbs1 Sinebell shift in 1st indirectly detected dimension (P) ... 507
sbs2 Sinebell shift in 2nd indirectly detected dimension (P) ... 507
sc Start of chart (P) ... 507
sc2 Start of chart in second direction (P) ... 508
scalelimits Set limits for scales in regression (M) ... 508
scalesw Set scaling factor for multipulse experiments (M) ... 508
scalesw Scale spectral width in directly detected dimension (P) ... 508
scalesw1 Set f_1 scaling factor for 2D multipulse experiments (M) ... 509
scalesw1 Scale spectral width in 1st indirectly detected dimension (P) ... 509
scalesw2 Scale spectral width in 2nd indirectly detected dimension (P) ... 509
sd Set first decoupler frequency to cursor position (M) ... 509
sd2 Set second decoupler frequency to cursor position (M) ... 509
sd3 Set third decoupler frequency to cursor position (M) ... 510
sda Set first decoupler frequency array (M) ... 510
sd2a Set second decoupler frequency array (M) ... 510
sd3a Set third decoupler frequency array (M) ... 510
sdp Show diffusion projection (M) ... 511
sel1d Apptype macro for Selective 1D experiments (M) ... 511
select Select spectrum, FID, trace, or 2D plane without display (C) ... 511
selex Defines excitation band (M) ... 512
selexcit Set up PFG selective excitation pulse sequence (M) ... 512
selexHT Set up a selective Hadamard experiment (M) ... 512
send2vnmr Send a command to VnmrJ (U) ... 513
seqfil Pulse sequence name (P) ... 513
seqgen Initiate compilation of user's pulse sequence (M,U) ... 513
serverport Returns the VnmrJ network listening port value (C) ... 514
set2D General setup for 2D experiments (M) ... 514
set2d General setup for 2D experiments (M) ... 514
set3dproc Set 3D processing (C) ... 515
setallshims Set all shims into hardware (M) ... 515
setcolor Set colors for graphics window and for plotters (C) ... 516

setdecpars Set decoupler parameter values from probe file (M) 517
setdec2pars Set decoupler 2 parameter values from probe file (M) 517
setdgroup Set the Dgroup of a parameter in a tree (C) 517
setenumeral Set values of a string parameter in a tree (C) 517
setether Connect or reconnect host computer to Ethernet (U) 518
setexport Set parameter bits for use with protocols (M) 518
setfrq Set frequency of rf channels (C) 518
setgauss Set a Gaussian fraction for lineshape (M) 519
setgcal Set the gradient calibration constant (M) 519
setgcoil Assign sysgcoil configuration parameter (M) 519
setgrid Divide graphics window into rows and columns (C) 520
setgroup Set group of a parameter in a tree (C) 520
sethtfrq1 Set a Hadamard frequency list from a line list ((M) 521
sethw Set values for hardware in acquisition system (C) 521
setint Set value of an integral (M) 523
setlimit Set limits of a parameter in a tree (C) 523
setlk Set up lock parameters (M) 524
setlockfreq Set lock frequency (M) 524
setLP Set up linear prediction in the direct dimension (M) 525
setLP1 Set F1 linear prediction parameters (M) 525
setlp0 Set parameters for zero linear phase (M) 525
setnoether Disconnect host computer from Ethernet (U) 525
setoffset Calculate offset frequency for given nucleus and ppm (M) 526
setparams Write parameter to current probe file (M) 526
setpen Set maximum number of HP plotter pens (M) 526
setplotdev Return characteristics of a named plotter (C) 527
setpower Set power and pulsewidth for a given γB1 value (M) 527
setprotect Set protection mode of a parameter (C) 527
setrc Set receiver constants (M) 529
setref Set frequency referencing (M) 529
setref1 Set freq. referencing for 1st indirectly detected dimension (M) 530
setref2 Set freq. referencing for 2nd indirect detected dimension (M) 531
setscout Set up a scout run (M) 531
setssfilter Set sslsfrq to the frequencies of each suppressed solvents (M) 532
setsw Set spectral width (M) 532
setsw1 Set spectral width in evolution dimension (M) 532
setsw2 Set spectral width in 2nd evolution dimension (M) 532
setselfrqc Set selective frequency and width (M) 533
setselinv Set up selective inversion (M) 533
settcldefault Select default display templates for pulse sequence (M) 533
settune Opens the Auto Tune Setup dialog (M) 533
settype Change type of a parameter (C) 533
setup Set up parameters for basic experiments (M) 534
setup_dosy Set up gradient levels for DOSY experiments (M) 534
setvalue Set value of any parameter in a tree (C) 535
setwave Write a wave definition string into Pbox.inp file (M) 535
setwin Activate selected window (C) 536
sf Start of FID (P) 536
sf1 Start of interferogram in 1st indirectly detected dimension (P) 536
sf2 Start of interferogram in 2nd indirectly detected dimension (P) 536
sfrq Transmitter frequency of observe nucleus (P) 537
sh2pul Set up for a shaped observe excitation sequence (M) 537
shdec Set up for shaped observe excitation sequence (M) 537
shell Start a UNIX shell (C) 537
shelli Start an interactive UNIX shell (C) 538
shim Submit an Autoshim experiment to acquisition (C) 538
shimset Type of shim set (P) 538
showconfig Show system configuration settings (M) 540
showconsole Show system configuration settings (U) 540
showfit Display numerical results of deconvolution (M) 540
showloginbox Shows operator login dialog (M) 540
shownumx Show x position of number (P) 540

shownumy Show y position of number (P) 541
showoriginal Restore first 2D spectrum in 3D DOSY experiment (M) 541
showplotter Show list of currently defined plotters and printers (M) 541
showplotq Display plot jobs in plot queue (M) 541
showprintq Display print jobs in print queue (M) 541
showprotunegui show the graphical interface while tuning (P) 541
showrfmon Show RF Monitor Button in Hardware Bar (P) 542
showstat Display information about status of acquisition (M,U) 542
sin Find sine value of an angle (C) 542
sine Find values for a sine window function (M) 542
sinebell Select default parameters for sinebell weighting (M) 543
sinesq Find values for a sine-squared window function (M) 543
size Returns the number of elements in an arrayed parameter (O) 544
slfreq Measured line frequencies (P) 544
slw Spin simulation linewidth (P) 544
smaxf Maximum frequency of any transition (P) 544
sminf Minimum frequency of any transition (P) 545
smsport Sample Management System serial port connection (P) 545
sn Signal-to-noise ratio (P) 545
solppm Return ppm and peak width of solvent resonances (M) 545
solvent Lock solvent (P) 546
solvinfo Retrieve information from solvent table (C) 546
sort Sort real values of a parameter (M) 546
sp Start of plot in directly detected dimension (P) 547
sp1 Start of plot in 1st indirectly detected dimension (P) 547
sp2 Start of plot in 2nd indirectly detected dimension (P) 547
spadd Add current spectrum to add/subtract experiment (C) 547
spcfrq Display frequencies of rf channels (M) 548
specdc3d 3D spectral dc correction (P) 548
spin Submit a spin setup experiment to acquisition (C) 549
spin Sample spin rate (P) 549
spincad Run SpinCAD program (C) 549
spingen Compile SpinCAD pulse sequence (M,U) 549
spinll Set up a slfreq array (M) 550
spinner Open the Spinner Control window (C) 551
spins Perform spin simulation calculation (C) 552
split Split difference between two cursors (M) 553
spintype Spinner Type ((P) 553
spmax Take the maximum of two spectra (C) 554
spmin Take minimum of two spectra in add/subtract experiment (C) 554
spsm Enter spin system (M) 554
spsub Subtract current spectrum from add/subtract experiment (C) 555
sqcosine Set up unshifted cosine-squared window function (M) 555
sqdir Study queue directory (P) 556
sqend End a study queue (M) 556
sqexp Load experiment from protocol (M) 556
sqfilemenu Study queue file menu commands (M) 556
sqmode Study queue mode (P) 556
sqname Study queue parameter template (P) 557
sqpars Create study queue parameters for imaging (M) 557
sqprotocol Macro to create protocols (M) 557
sqreset Reset study queue parameters for imaging (M) 557
sqrt Return square root of a real number (O) 558
sqsavestudy Macro to save study parameters for imaging (M) 558
sqsinebell Set up unshifted sinebell-squared window function (M) 558
srate Spinning rate for magic angle spinning (P) 558
sread Read converted data into VnmrJ (C) 559
srof2 Calculate exact rof2 value for Cold Probes (M) 559
ss Steady-state transients (P) 559
ssecho Set up solid-state echo pulse sequence (M) 559
ssecho1 Set up parameters for SSECHO1 pulse sequence (M) 559
ssfilter Full bandwidth of digital filter to yield a filtered FID (P) 560

sslsfrq Center of solvent-suppressed region of spectrum (P) 560
ssntaps Number of coefficients in digital filter (P) 560
ssorder Order of polynomial to fit digitally filtered FID (P) 561
stack Stacking mode for processing and plotting arrayed spectra (M) ... 561
stackmode Stacking control for processing arrayed 1D spectra (P) 562
startq Start a chained study queue (M) 562
status Display status of sample changer (C,U) 562
std1d Apptype macro for Standard 1D experiments (M) 562
stdshm Interactively create a method string for autoshimming (M) 563
sth Minimum intensity threshold (P) 563
string Create a string variable (C) 563
strtext Starting point for LP data extension in np dimension (P) 564
strtext1 Starting point for LP data extension in ni dimension (P) 564
strtext2 Starting point for LP data extension in ni2 dimension (P) 564
strtlp Starting point for LP calculation in np dimension (P) 564
strtlp1 Starting point for LP calculation in ni dimension (P) 565
strtlp2 Starting point for LP calculation in ni2 dimension (P) 565
studyid Study identification (P) 565
studypar Study parameters (P) 565
studystatus Study status (P) 566
studytime Study time (P) 566
su Submit a setup experiment to acquisition (M) 566
sub Subtract current FID from add/subtract experiment (C) 567
substr Select a substring from a string (C) 567
suselfrq Select peak, continue selective excitation experiment (M) 568
svdat Save data (C) 569
svf Save FIDs in current experiment (M) 569
svfdf Save FID data in FDF format (M) 570
svfdir Directory for non-study data (P) 570
Svfname Create path for data storage (C) 570
svfname Filename parameter template for non-study data ((P) 572
svp Save parameters from current experiment (M) 572
svs Save shim coil settings (C) 573
svs Spin simulation vertical scale (P) 573
svtmp Move experiment data into experiment subfile (M) 573
sw Spectral width in directly detected dimension (P) 574
sw1 Spectral width in 1st indirectly detected dimension (P) 574
sw2 Spectral width in 2nd indirectly detected dimension (P) 575
sw3 Spectral width in 3rd indirectly detected dimension (P) 575
sysgcoil System gradient coil (P) 575
system System type (P) 575
systemdir VnmrJ system directory (P) 576

T

t1 T_1 exponential analysis (M) 578
t1s T_1 exponential analysis with short output table (M) 578
t2 T_2 exponential analysis (M) 579
t2s T_2 exponential analysis with short output table (M) 579
tabc Convert data in table order to linear order (M) 579
tan Find tangent value of an angle (C) 580
tape Read tapes from VXR-style system (M,U) 580
tape Control tape options of files program (P) 581
tchan RF channel number used for tuning (P) 581
tcl Send Tcl script to Tcl version of dg window (C) 582
temp Open the Temperature Control window (C) 582
temp Sample temperature (P) 582
tempcal Temperature calculation (C) 583
tempcalc Measure approximate sample temperature in Cold Probes (M) 583
testacquire Test acquire mode (P) 583
testct Check ct for resuming signal-to-noise testing (M) 583
testsn Test signal-to-noise of a spectrum (M) 584

teststr Find which array matches a string M) 584
text Display text or set new text for current experiment (C) 585
textis Return the current text display status (C) 585
textvi Edit text file of current experiment (M)..... 586
th Threshold (P) 586
th2d Threshold for integrating peaks in 2D spectra (P)..... 586
thadj Adjust threshold for peak printout (M)..... 586
time Display experiment time or recalculate number of transients (M) . 587
tin Temperature interlock (P) 587
tlt First-order baseline correction (P) 588
tmove Left-shift FID to time-domain cursor (M) 588
tmsref Reference 1D proton or carbon spectrum to TMS (M) 588
tn Nucleus for observe transmitter (P) 588
tncosyps Set up parameters for TNCOSYPS pulse sequence (M) 589
tndqcosy Set up parameters for TNDQCOSY pulse sequence (M) 589
tnmqcosy Set up parameters for TNMQCOSY pulse sequence (M) 589
tnnoesy Set up parameters for TNNOESY pulse sequence (M) 589
tnroesy Set up parameters for TNROESY pulse sequence (M) 589
tntocsy Set up parameters for TNTOCSY pulse sequence (M) 589
Tocsy Convert the parameters to a TOCSY experiment (M)..... 589
Tocsy1d Convert the parameter set to a Tocsy1d experiment (M)..... 590
tocsyHT Set up the tocsyHT experiment (M) 590
tof Frequency offset for observe transmitter (P) 590
tpwr Observe transmitter power level with linear amplifiers (P)..... 590
tpwrf Observe transmitter fine power (P)..... 591
tpwrm Observe transmitter linear modulator power (P) 591
trace Mode for *n*-dimensional data display (P) 591
traymax Sample changer tray slots (P) 592
troesy Set up parameters for TROESY pulse sequence (M) 592
trunc Truncate real numbers (O)..... 592
tshift Adjust tau2 to current cursor position (M) 592
tugain Receiver gain used in tuning (P)..... 593
tune Assign a frequency to a channel for probe tuning (C)..... 593
tunehf Tune both H1 and F19 on an HFX probe (M) 594
tunematch Default match target, in percent of optimum (P) 594
tunemethod Method to use for tuning (P)..... 594
tuneResult Message indicating how well the tuning succeeded (P) 595
tunesw Width of the tuning sweep in Hz (P)..... 595
tupwr Transmitter power used in tuning (P) 595
typeof Return identifier for argument type (O)..... 595

U

ultra8 selects the Ultra 8 shim configuration (M) 597
ultra18 Select 18 shim configuration for Ultra 18 shim power supply (M) 597
undospins Restore spin system as before last iterative run (M)..... 597
undosy Restore original 1D NMR data from sub experiment (M)..... 598
unit Define conversion units (C)..... 598
unlock Remove inactive lock and join experiment (C) 599
updatepars Update all parameter sets saved in a directory (M) 599
updateprobe Update probe file (M) 600
updaterev Update after installing new VnmrJ version (M) 600
updtgcoil Update gradient coil (M)..... 600
updtparam Update specified acquisition parameters (C)..... 600
usemark Use “mark” output as deconvolution starting point (M)..... 601
userdir VnmrJ user directory (P)..... 601
usergo Experiment setup macro called by go, ga, and au (M) 601
userfixpar Macro called by fixpar (M)..... 601

V

vast1d Set up initial parameters for VAST experiments (M) 604
vastget Selects and displays VAST spectra (M)..... 604

vastglue Assemble 1D datasets into a 2D (or pseudo-2D) datasets (M)..... 604
vastglue2 Assemble 1D datasets into a 2D (or pseudo-2D) datasets (M)..... 604
vastgo Turn off LC stop flow automation, start VAST automation (M) 605
vbg Run VNMR processing in background (U) 605
vf Vertical scale of FID (P) 606
vi Edit text file with vi text editor (M)..... 606
vibradd Display relative amplitudes of Cold Probe vibrations (M)..... 608
vjhelp Display VnmrJ help (U)..... 608
vn Start VNMR directly (U) 608
vnmr Starts VnmrJ (U)..... 609
vnmr2sc VNMR to SpinCAD pulse sequence translator (M) 609
vnmr_accounting Open Accounting window (U)..... 610
vnmrjcmd() Commands to invoke the GUI popup (C)..... 610
vnmrexit Exit from the VNMR system (C)..... 611
vnmrj Start VnmrJ (U)..... 611
vnmrplot Plot files (U)..... 611
vnmrprint Print text files (U) 611
vo Vertical offset (P) 612
vp Vertical position of spectrum (P) 612
vpaction Set initial state for multiple viewports (M)..... 612
vpf Current vertical position of FID (P)..... 612
vpfi Current vertical position of imaginary FID (P) 613
vpset3def Set the viewport state to three default viewports (M)..... 613
vpsetup Set new viewports (M)..... 613
vs Vertical scale (P)..... 613
vs2d Vertical scale for 2D displays (P) 614
vsadj Automatic vertical scale adjustment (M)..... 614
vsadj2 Automatic vertical scale adjustment by powers of 2 (M)..... 614
vsadjc Automatic vertical scale adjustment for 13C spectra (M) 615
vsadjh Automatic vertical scale adjustment for ^{1}H spectra (M) 615
vsproj Vertical scale for projections and traces (P)..... 616
vtairflow Variable Temperature Air Flow (P)..... 616
vtairlimits Variable Temperature Air Flow Limits (P) 616
vtc Variable temperature cutoff point (P) 617
vtcomplvl Variable temperature compensation for gradient shimming (P) 617
vttype Variable temperature controller present (P) 617
vtwait Variable temperature wait time (P) 618
vxr_unix Convert VXR-style text files to UNIX format (M, U) 618

W

w Who is using system (C)..... 620
walkup Walkup automation (M)..... 620
waltz WALTZ decoupling present (P) 620
wbs Specify action when bs transients accumulate (C) 621
wbs When block size (P)..... 621
wc Width of chart (P) 621
wc2 Width of chart in second direction (P)..... 621
wcmax Maximum width of chart (P) 622
wc2max Maximum width of chart in second direction (P)..... 622
wdone Specify action when experiment is done (C)..... 622
wdone Specify action when experiment is done (P) 622
werr Specify action when error occurs (C) 623
werr When error (P) 623
wet Flag to turn on or off wet solvent suppression ((P) 624
Wet1d Set up parameters for wet ^{1}H experiment (M)..... 624
wetdqcosy Set up parameters for a WETDQCOSY pulse sequence (M)..... 624
wetgcosy Set up parameters for a WETGCOSY pulse sequence (M)..... 624
wetghmqcps Set up parameters for a WETGHMQCPS pulse sequence (M) 624
wetghsqc Set up parameters for a WETGHSQC pulse sequence (M)..... 624
wetgmqcosy Set up parameters for a WETGHSQC pulse sequence (M)..... 624
wetit Set up and create pulse shapes for Wet1d experiment (M)..... 624

wetnoesy Set up parameters for a WETNOESY pulse sequence (M) 625
wetpeaks Number of peaks for wet solvent suppression (P) 625
wetpwxcal Set up parameters for a WETPWXCAL pulse sequence (M) 625
wettntocsy Set up parameters for a WETTNTOCSY pulse sequence (M) 625
wetshape Shape for pwwet pulses (P) 625
wexp Specify action when experiment completes (C) 625
wexp When experiment completes (P) 626
wf Width of FID (P) 626
wf1 Width of interferogram in 1st indirectly detected dimension (P) ... 627
wf2 Width of interferogram in 2nd indirectly detected dimension (P) .. 627
wfgtest Waveform generator test (M) 627
wft Weight and Fourier transform 1D data (C) 627
wft1d Weight and Fourier transform f_2 for 2D data (C) 627
wft1da Weight and Fourier transform phase-sensitive data (M) 628
wft1dac Combine arrayed 2D FID matrices (M) 628
wft2d Weight and Fourier transform 2D data (C) 628
wft2da Weight and Fourier transform phase-sensitive data (M) 629
wft2dac Combine arrayed 2D FID matrices (M) 629
wftt3 Process f_3 dimension during 3D acquisition (M) 630
which Display which command or macro is used (M) 630
wnt Specify action when nt transients accumulate (C) 630
wnt When number of transients (P) 631
wp Width of plot in directly detected dimension (P) 631
wp1 Width of plot in 1st indirectly detected dimension (P) 631
wp2 Width of plot in 2nd indirectly detected dimension (P) 632
write Write formatted text to a device (C) 632
writefid Write numeric text file using a FID element (C) 634
writeparam Write one of more parameters to a file (C) 634
writespectrum write a spectrum to a binary file (C) 634
wrtp Command string executed after rtp command (P) 635
wsram Send hardware configuration to acquisition console (C) 635
wshim Conditions when shimming is performed (P) 635
wtfile User-defined weighting in directly detected dimension (P) 636
wtfile1 User-defined weighting in 1st indirectly detected dimension (P) ... 636
wtfile2 User-defined weighting in 2nd indirectly detected dimension (P) . 636
wtgen Compile user-written weighting functions (M,U) 637
wti Interactive weighting (C) 637
wtia Interactive weighting for 2D absorptive data (M) 638
wtune Specify when to tune (P) 638
wtunedone What to do after ProTune tuning is done (P) 639
wysiwyg Set plot display or full display (P) 639

X

x0 X-zero position of HP pen plotter or Postscript device (P) 642
x1 X1 shim gradient (P) 642
x2y2 X2Y2 shim gradient (P) 642
x3 X3 shim gradient (P) 642
x4 X4 shim gradient (P) 642
xdiag Threshold for excluding diagonal peaks when peak picking (P) 643
xgate Load time counter (M) 643
xm1 Utility macro for study queue experiment manager (M) 643
xmaction Perform study queue action (M) 643
xmactionw Perform study queue action for walkup (M) 643
xmaddreq Add a required protocol before the main protocol (M) 644
xmcheckreq Check required protocol name (M) 644
xmconvert Convert a temporarily stored study into a submitted study (M) 644
xmcopy Copy protocols in a study queue (M) 644
xmdelete Delete nodes in a study queue (M) 644
xmenablepanel Enable or disable a parameter panel (M) 644
xmendq End a chained study queue (M) 644
xmgetatts Get study queue attributes (M) 645

xmHprescan Set up and process Proton prescans (M) ... 645
xminit Initialize an imaging study queue (M) ... 645
xmlockup Move a study queue node up and lock it (M) ... 645
xmmakenode Make a new study queue node (M) ... 645
xmnext Find next prescan or next experiment in study queue (M) ... 645
xmprescan Run prescans in study queue (M) ... 646
xmreact Recover from error conditions during automation study (M) ... 646
xmreadnode Read attributes from a study queue node (M) ... 646
xmrtpar Retrieve parameters from a study queue node (M) ... 646
xmsample Write enterQ entry for a sample for study queue – liquids (M) ... 646
xmsara Write enterQ entry for a sample for study queue – imaging (M) ... 647
xmsatfrq Processing for Presat experiment (M) ... 647
xmselect Action when study queue node is selected (M) ... 647
xmsetatts Set an attribute for a study queue node (M) ... 647
xmsetattr Set an attribute for a study queue node (M) ... 647
xmshowdata Show data from a study queue node (M) ... 647
xmstartnightq Start the night queue (M) ... 648
xmsubmit Submit sample(s) to the study queue (M) ... 648
xmtime Update the study queue time (M) ... 648
xmtune Check tune parameter during automation (M) ... 648
xmwerr Recover from acquisition error in study queue (M) ... 649
xmwexp Processing macro for end of acquisition in study queue (M) ... 649
xmwritenode Write study queue node attributes (M) ... 649
xmwritesq Write study queue node order (M) ... 649
xpol Cross-polarization (P) ... 649
xpolar1 Set up parameters for XPOLAR1 pulse sequence (M) ... 649
xy XY shim gradient (P) ... 650
xz XZ shim gradient (P) ... 650
xz2 XZ2 shim gradient (P) ... 650

Y

y0 Y-zero position of HP pen plotter or Postscript device (P) ... 651
y1 Y1 shim gradient (P) ... 651
y3 Y3 shim gradient (P) ... 651
y4 Y4 shim gradient (P) ... 651
yz YZ shim gradient (P) ... 651
yz2 YZ2 shim gradient (P) ... 652

Z

z Add integral reset point at cursor position (C) ... 653
z0 Z0 field position (P) ... 654
z1 Z1 shim gradient (P) ... 654
z1c Z1C shim gradient (P) ... 654
z2 Z2 shim gradient (P) ... 654
z2c Z2C shim gradient (P) ... 655
z2x2y2 Z2X2Y2 shim gradient (P) ... 655
z2x3 Z2X3 shim gradient (P) ... 655
z2xy Z2XY shim gradient (P) ... 655
z2y3 Z2Y3 shim gradient (P) ... 655
z3 Z3 shim gradient (P) ... 655
z3c Z3C shim gradient (P) ... 655
z3x Z3X shim gradient (P) ... 655
z3x2y2 Z3X2Y2 shim gradient (P) ... 656
z3x3 Z3X3 shim gradient (P) ... 656
z3xy Z3XY shim gradient (P) ... 656
z3y Z3Y shim gradient (P) ... 656
z3y3 Z3Y3 shim gradient (P) ... 656
z4 Z4 shim gradient (P) ... 656
z4c Z4C shim gradient (P) ... 656
z4x Z4X shim gradient (P) ... 656
z4x2y2 Z4X2Y2 shim gradient (P) ... 657

z4xy Z4XY shim gradient (P) 657
z4y Z4Y shim gradient (P) 657
z5 Z5 shim gradient (P) 657
z5x Z5X shim gradient (P) 657
z5y Z5Y shim gradient (P) 657
z6 Z6 shim gradient (P) 657
z7 Z7 shim gradient (P) 657
z8 Z8 shim gradient (P) 658
zeroneg Set all negative intensities of 2D spectra to zero (C) 658
zoom Adjust display to given width (M) 658
zx2y2 ZX2Y2 shim gradient (P) 658
zx3 ZX3 shim gradient (P) 658
zxy ZXY shim gradient (P) 658
zy3 ZY3 shim gradient (P) 658

Index 661

Notational Conventions

The *VnmrJ Command and Parameter Reference* describes in detail the commands, macros, and parameters in VnmrJ software. Information new to VnmrJ in this version is shown by a change bar (as shown to the left of this paragraph).

Title Line Codes

Each entry has a letter in parentheses in the title line that identifies the type of entry:

(C)	VnmrJ command
(M)	VnmrJ macro command (from the `maclib` directory)
(O)	MAGICAL programming operator
(P)	VnmrJ parameter
(U)	UNIX command (not executable within VnmrJ)
(C,U) (M,U)	Executable from UNIX or VnmrJ (note that syntax is different)

Applicability

An entry with applicability information applies only to the system or accessory listed. If the entry does not include applicability information, the entry applies to all systems.

Command and Macro Syntax

Each command and macro entry includes the syntax used when entering it into the system. The following examples illustrate this syntax:

`halt`	If no parentheses are shown, enter the command or macro exactly as shown, e.g., enter `halt`.
`delexp(exp_num)`	If parentheses are shown, enter the command or macro name as shown, but replace arguments with a value, e.g., if `exp_num` is `5`, enter `delexp(5)`.
`rttmp(file)`	Arguments can be a string (e.g., name of file or solvent), number, variable, or parameter (e.g., `pw`),. If a string, enclose it with single quote marks, *e.g., if* `file` *is* `samp02`*, enter* `rttmp('samp02')`. If number, variable, or parameter, do *not* use marks.
`rl<(frequency)>`	Angle brackets (`<` and `>`) indicate optional input, e.g., if `frequency` not needed or the default value of `frequency` is acceptable, enter `rl`, but if `frequency` has a value such as 10, enter `rl(10)`.

`md(<from_exp,>to_exp)`	Arguments can also be optional. Use a comma to separate arguments, e.g., `md(2,3)`. Unless stated otherwise, the order of arguments is often important.
`nll<('pos')>`	A keyword is frequently used as an argument. In the syntax, keywords are shown in single quotes and are entered exactly as shown, e.g., to use the optional keyword `'pos'` for `nll`, enter `nll('pos')`.
`dc2d('f1'|'f2')`	A vertical bar indicates an OR condition, e.g., either `'f1'` or `'f2'` can be an argument to `dc2d`.
`sin(angle)<:n>`	Some commands return values to a calling macro. This is shown by a colon followed by one or more variables, e.g., if `angle` is variable `x` and `n` is variable `rt`, then `sin(x):rt` returns the value of `sin(x)` to the calling macro via the variable `rt`.
`z(reset1,reset2,...)`	Three dots indicate the sequence of arguments continues. Unless a limit is given, you can enter one argument, two, three, or as many as needed.

Parameter Syntax

Parameter syntax is always in the form `parameter_name=value`. If `value` is a string, enclose it in single quote marks; otherwise, no marks are used, e.g., `auto='y'`, `plotter='ThinkJet'`, `spin=5`. Note that some parameters are not user-enterable.

Notational Conventions

Throughout all Varian, Inc. NMR manuals, `typewriter-like characters` identify commands, parameters, directories, file names, and text displayed on the screen.

Because pressing the Return key is required at the end of almost every command or line of text you type on the keyboard, assume this use of the Return key unless stated otherwise.

Other Sources of Information

For further information about an entry, refer to the manual listed under “See also.” For general coverage on VnmrJ, refer to the following manuals (each manual is also online):

VnmrJ Walkup

NMR Spectroscopy User Guide

VnmrJ Installation and Administration

VnmrJ Imaging NMR

A

aa	Abort acquisition with error (C)
abort	Terminate action of calling macro and all higher macros (C)
abortallacqs	Reset acquisition computer in a drastic situation (C)
abortoff	Terminate normal functioning of abort in a macro (C)
aborton	Restore normal functioning of abort in a macro (C)
abs	Find absolute value of a number (C)
AC1S-AC11S	Autocalibration macros (M)
ACbackup	Make backup copy of current probe file (M)
acct	Writes records for operator login and logoff (M)
ACreport	Print copy of probe file after autocalibration (M)
acos	Find arc cosine of number (C)
acosy	Automatic analysis of COSY data (C)
acosyold	Automatic analysis of COSY data, old algorithm (C)
acqdisp	Display message on the acquisition status line (C)
acqi	Interactive acquisition display process (C)
acqmeter	Open Acqmeter window (M)
Acqmeter	Open Acqmeter window (U)
acqmode	Acquisition mode (P)
acqstat	Open Acquisition Status window (M)
Acqstat	Open Acquisition Status window (U)
acqstatus	Acquisition status (P)
acquire	Acquire data (M)
actionid	Current study queue node id (P)
activestudy	Active study name (P)
add	Add current FID to add/subtract experiment (C)
addi	Start interactive add/subtract mode (C)
addnucleus	Add new nucleus to existing probe file (M)
addpar	Add selected parameters to current experiment (M)
addparams	Add parameter to current probe file (M)
addprobe	Create new probe directory and probe file (M)
adept	Automatic DEPT analysis and spectrum editing (C)
aexppl	Automatic plot of spectral expansion (M)
ai	Select absolute-intensity mode (C)
aig	Absolute-intensity group (P)
alfa	Set alfa delay before acquisition (P)
alock	Automatic lock control (P)
ampmode	Independent control of amplifier mode (P)
amptype	Amplifier type (P)
analyz	Calculate standard peak height (M)
analyze	Generalized curve fitting (C)
ap	Print out “all” parameters (C)
ap	“All” parameters display control (P)
apa	Plot parameters automatically (M)

A

aph	Automatic phase adjustment of spectra (C)
aph0	Automatic phase of zero-order term (C)
aphb	Auto phasing for Bruker data (C)
aphx	Perform optimized automatic phasing (M)
appdirs	Starts Applications Directory Editor (M)
appmode	Application mode (P)
apptype	Application type (P)
Apt	Set up parameters for APT experiment (M)
aptaph	Automatic processing for APT spectra (M)
array	Easy entry of linearly spaced array values (M)
array	Parameter order and precedence (P)
arraydim	Dimension of experiment (P)
asin	Find arc sine of number (C)
asize	Make plot resolution along f_1 and f_2 the same (M)
assign	Assign transitions to experimental lines (M)
at	Acquisition time (P)
atan	Find arc tangent of a number (C)
atan2	Find arc tangent of two numbers (C)
atcmd	Call a macro at a specified time (M)
atext	Append string to current experiment text file (M)
attval	Calculate pulse width (M)
atune	ProTune Present (P)
au	Submit experiment to acquisition and process data (M)
AuCALch3i	Set up autocalibration with CH3I sample (M)
AuCALch3i1	Get autocalibration with CH_3I sample (M)
AuCALch3oh	Set up autocalibration with Autotest sample (M)
AuCALch3oh1	Get autocalibration with Autotest sample (M)
Aucalibz0	Automatic Hz to DAC calibration for Z0 (M)
AuCdec	Carbon decoupler calibration macro (M)
AuCgrad	Carbon/proton gradient ratio calibration macro (M)
AuCobs	Carbon observe calibration macro (M)
audiofilter	Audio filter board type (P)
Aufindz0	Automatic adjustment of Z0 (M)
Augcal	Probe gcal calibration macro (M)
Augmap	Automated gradient map generation (M)
Augmapz0	Automatic lock gradient map generation and z0 calibration (M)
AuHdec	Proton decoupler calibration (M)
AuHobs	Proton observe calibration macro (M)
Aumakegmap	Auto lock gradient map generation (M)
AuNuc	Get parameters for a given nucleus (M)
auto	Prepare for an automation run (C)
auto	Automation mode active (P)
auto_au	Controlling macro for automation (M)
Autobackup	Back up current probe file (M)
autodept	Automated complete analysis of DEPT data (M)
autodir	Automation directory absolute path (P)
autogo	Start automation run (C)

autolist	Set up and start chained acquisition (M)
autoname	Create path for data storage (C)
autoname	Prefix for automation data file (P)
autora	Resume suspended automation run (C)
autosa	Suspend current automation run (C)
autoscale	Resume autoscaling after limits set by scalelimits macro (M)
autostack	Automatic stacking for processing and plotting arrays (M)
autotest	Open Auto Test Window (C)
autotime	Displays approximate time for automation (M)
av	Set abs. value mode in directly detected dimension (C)
av1	Set abs. value mode in 1st indirectly detected dimension (C)
av2	Set abs. value mode in 2nd indirectly detected dimension (C)
averag	Calculate average and standard deviation of input (C)
awc	Additive weighting const. in directly detected dimension (P)
awc1	Additive weighting const. in 1st indirectly detected dimension (P)
awc2	Additive weighting const. in 2nd indirectly detected dimension (P)
axis	Provide axis labels and scaling factors (C)
axis	Axis label for displays and plots (P)
axisf	Axis label for FID displays and plots (P)

aa — Abort acquisition with error (C)

Syntax: `aa`

Description: Aborts an experiment that has been submitted to acquisition. If the experiment is active, it is aborted immediately, all data is discarded, and the experiment is interpreted as an error. Any data collected from an earlier block size transfer is retained. If any `werr` processing is defined, that processing occurs, followed by any queued experiments. The `login` name, and the FID directory path in `file` are used as keys to find the proper experiment to abort.

In some circumstances, there is a delay between the time `go` is entered and the acquisition is started. During this time, instructions based on the selected pulse sequence are being generated. This is signified by the letters “PSG” appearing in the upper left corner of the status window. An `aa` command issued under these circumstances reports that no acquisition is active but it instead stops the instruction generation process and the message “PSG aborted” appears.

See also: *NMR Spectroscopy User Guide*

Related:

file	File name of a parameter set (P)
go	Submit experiment to acquisition (C)
halt	Abort acquisition with no error (C)
werr	Specify action when error occurs (C)
werr	When error (P)

abort — Terminate action of calling macro and all higher macros (C)

Syntax: `abort`

Description: Terminates the action of the calling macro and all higher levels of nested macros. `abort` is used only in macros and not entered from the keyboard. It generates an error condition, which is the reason why the calling macro and any

parent (nested) macros above will also be aborted. To exit from the execution of a macro without generating an error, use return.

See also: *VnmrJ User Programming*

Related:

abortoff	Terminate normal functioning of abort in a macro (C)
aborton	Restore normal functioning of abort in a macro (C)
return	Terminate execution of a macro (C)

abortallacqs — Reset acquisition computer in a drastic situation (C)

Syntax: abortallacqs

Description: Reboots the acquisition system from the host computer. Wait at least 30 seconds before attempting new acquisitions.

See also: *NMR Spectroscopy User Guide*

abortoff — Terminate normal functioning of abort in a macro (C)

Syntax: abortoff

Description: Changes the action of an abort command in a macro. Normally, abort (or any command aborting with an error condition) terminates the action of the calling macro and all higher levels of nested macros; however if the abortoff command is executed prior to a macro containing the abort command, only the macro containing abort terminates and execution continues to the next macro. The operation of the abortoff command is nullified by the aborton command. abortoff is used only in macros and not entered from the keyboard.

See also: *VnmrJ User Programming*

Related:

abort	Terminate action of calling macro and all higher macros (C)
aborton	Restore normal functioning of abort in a macro (C)

aborton — Restore normal functioning of abort in a macro (C)

Syntax: aborton

Description: Nullifies the operation of a abortoff command and restores the normal functioning of the abort command. aborton is used only in macros and not entered from the keyboard.

See also: *VnmrJ User Programming*

Related:

abortoff	Terminate normal functioning of abort in a macro (C)

abs — Find absolute value of a number (C)

Syntax: abs(number)<:value>

Description: Finds the absolute value of a number. Absolute value is a nonnegative number equal in numerical value to the given number (e.g., abs(-6.5) is 6.5).

Arguments: number is the given real number.

value is the return value with the absolute value of the given number. The default is to display the value in the status window.

Examples:

```
abs(-25)
abs(n):abs_val
```

See also: *VnmrJ User Programming*

AC1S-AC11S — Autocalibration macros (M)

Syntax: ACnS, where n is a number from 1 to 11.

Description: Performs automatic system calibration. When finished with the calibration routines, the current probe file is updated. If the probe is new to the system (i.e., all values in the probe file are zero), system power levels are determined followed by calibration. If power levels are listed in the current probe file, these values are used. The macro AC1S determines ^{1}H pw90, AC5S begins ^{13}C calibration, including decoupler power calibrations. AC10S performs ^{19}F calibration, and AC11S performs ^{31}P calibration.

See also: *NMR Spectroscopy User Guide*

ACbackup — Make backup copy of current probe file (M)

Syntax: ACbackup

Description: Called by the autocalibration macros AC1S-AC11S to back up the probe file after calibration ends. This macro is not usually called by the user.

See also: *NMR Spectroscopy User Guide*

Related: AC1S-AC11S Autocalibration macros (M)

acct — Writes records for operator login and logoff (M)

Applicability: VnmrJ

Syntax: acct('start'|'done')

Description: acct writes operator login and logoff records to the system adm/tmp/macrorecords.txt file used by the accounting package.

See also: *VnmrJ Installation and Administration* manual

Related:

operator	operator name (P)
operatorlogin	Sets work space and parameters for the operator (M)
vnmr_accounting	Open Accounting window (U)

ACreport — Print copy of probe file after autocalibration (M)

Syntax: ACreport

Description: Called by the autocalibration macros AC1S-AC11S to print a copy of the probe file before beginning a new autocalibration run.

See also: *NMR Spectroscopy User Guide*

Related: AC1S-AC11S Autocalibration macros (M)

acos — Find arc cosine of number (C)

Syntax: acos(value):n

Description: Finds the arc cosine (also called the inverse cosine) of a number.

Arguments: value is a number in the range of ±–1.0 to +1.0.

n is a return argument giving the arc cosine, in radians, of value. The default is to display the arc cosine value in the status window.

Examples:
```
acos(.5)
acos(value):acos_val
```

See also: *VnmrJ User Programming*

Related: sin Find sine value of an angle (C)

A

acosy — Automatic analysis of COSY data (C)

Syntax: `acosy`

Description: Automatically analyzes a 2D COSY data set with `fn`=`fn1` and `sw`=`sw1`. In this algorithm, a fuzzy pattern recognition technique is used to detect peaks and cluster the cross peaks into groups. Symmetry measures and chemical shifts for all cross peaks are calculated. Connectivities and the correlation table are displayed on the computer screen. This method is less sensitive to the threshold and rejects most artifacts in the peak list.

See also: *NMR Spectroscopy User Guide*

Related:

`acosyold`	Automatic analysis of COSY data (C)
`fn`	Fourier number in 1st indirectly detected dimension (P)
`fn1`	Fourier number in directly detected dimension (P)
`ll2d`	Automatic and interactive 2D peak picking (C)
`sw`	Spectral width in directly detected dimension (P)
`sw1`	Spectral width in 1st indirectly detected dimension (P)

acosyold — Automatic analysis of COSY data, old algorithm (C)

Syntax: `acosyold`

Description: Analyzes COSY data using an old algorithm.

See also: *NMR Spectroscopy User Guide*

Related:

`acosy`	Automatic analysis of COSY data (C)
`fn`	Fourier number in 1st indirectly detected dimension (P)
`fn1`	Fourier number in directly detected dimension (P)
`ll2d`	Automatic and interactive 2D peak picking (C)
`sw`	Spectral width in directly detected dimension (P)
`sw1`	Spectral width in 1st indirectly detected dimension (P)

acqdisp — Display message on the acquisition status line (C)

Syntax: `acqdisp(message)`

Description: Displays the message specified on the acquisition status line. `acqdisp` is used primarily by the acquisition process to update the screen.

Arguments: `message` is a text string, up to 8 characters long.

See also: *NMR Spectroscopy User Guide*

acqi — Interactive acquisition display process (C)

Syntax: `acqi<('par'|'disconnect'|'exit'|'standby')><:$ret>`

Description: Opens the Acquisition window for interactive locking and shimming on the lock signal, FID, or spectrum. When using a spectrometer, `acqi` normally automatically starts. On all systems, if the console has been recently rebooted, enter `su` before running `acqi`.

If `acqi` is connected to the console and you start an acquisition (`su`/`go`/`au`), `acqi` automatically disconnects.

The pulse sequence and parameter set for the FID/spectrum display can be selected by entering `gf`. Note that if clicking the FID button in `acqi` causes `acqi` to "disconnect," the common cause is that `gf` had not been executed.

The FID display is controlled by the parameters `lsfid`, `phfid`, and `dmgf`. These display parameters are automatically sent to `acqi` when `acqi` is first invoked. These parameters may subsequently be changed and sent again to

acqi with the command acqi('par'). If phfid is not set to "Not Used" for the FID display in acqi, a slide control will be available in acqi for the interactive adjustment of the phfid parameter. The slide will be in the IPA set of adjustments. If the parameter dmgf exists and is set to 'av', the FID display in acqi displays the square root of the sum of the squares of the real and imaginary channels.

The spectrum display is controlled by parameters sp, wp, dmg, rp, lp, rfl, rfp, vs, vp, sw, and fn. These parameters are automatically sent to acqi when acqi is first invoked. These parameters can subsequently be changed and sent again to acqi with the command acqi('par'). The preparation macro gf also calls acqi('par'), thereby causing these parameters to be sent to acqi. If fn is greater than 64K, it is lowered to 64K.

A convenient method of setting these parameters is to acquire a spectrum with go, then ft and adjust the display with the ds command options. Once the display is set the way you want, enter gf. The same display should then appear when the spectrum display is selected from acqi. Note that weighting parameters are not used in the *acqi* spectrum display.

The manual *NMR Spectroscopy User Guide* has a step-by-step description of using acqi.

Arguments: 'par' causes the current values of parameters lsfid, phfid, dmgf, sp, wp, dmg, rp, lp, rfl, rfp, vs, sw, and fn to be sent to acqi.

'disconnect' causes acqi to be disconnected. Clicking the Close button in acqi is equivalent, and puts acqi in the standby mode. Lock parameters, the spin parameter, and the shim values are sent back to the current experiment when acqi is "disconnected." If the experiment has the load parameter set to 'y', then the shim values are not delivered to the experiment.

'exit' causes an exit from acqi. Clicking the exit button in the Acquisition window is equivalent.

$ret is a return value with the success or failure of running acqi. The default is a warning displayed in the status window if acqi fails.

'standby' starts acqi and puts it into the standby mode.

Examples:

```
acqi
acqi('par')
acqi('disconnect')
acqi('exit')
acqi:$ok
```

See also: *NMR Spectroscopy User Guide*

Related:

Acqstat	Bring up the acquisition status display (U)
dmg	Display mode in directly detected dimension (P)
dmgf	Absolute-value display of FID data or spectrum in acqi (P)
ds	Display a spectrum (C)
fn	Fourier number in directly detected dimension (P)
ft	Fourier transform 1D data (C)
gf	Prepare parameters for FID/spectrum display in acqi (M)
go	Submit an experiment to acquisition (C)
load	Load status of displayed shims (P)
lkof	Track changes in lock frequency (P)
lp	First-order phase in directly detected dimension (P)
lsfid	Number of complex points to left-shift the np FID (P)
phfid	Zero-order phasing constant for np FID (P)
rfl	Ref. peak position in 1st indirectly detected dimension (P)
rfp	Ref. peak frequency in directly detected dimension (P)
rp	Zero-order phase in directly detected dimension (P)
sp	Start of plot in directly detected dimension (P)

spin	Sample spin rate (P)
sw	Spectral width in directly detected dimension (P)
vp	Vertical position of the spectrum (P)
vs	Vertical scale (P)
wp	Width of plot in directly detected dimension (P)

acqmeter — Open Acqmeter window (M)

Syntax: `acqmeter<(remote_system)>`

Description: Opens the Acqmeter window and shows a time line of lock level, temperature (VT), and/or spinner speed. When first opened, only lock level is displayed. By clicking anywhere in the lock level window with the right mouse button, a menu pops up with choices to close the lock level window, show a temperature (VT) window, show a spinner window, open a properties window, or close the Acqmeter window. Click on the choice desired in the menu with either the left or right mouse button. In the properties window, the host, font, color, and graphical mode can be changed. Continue to click in any Acqmeter window with the right mouse button to open the menu and then open or close windows, or close the Acqmeter window, as desired.

Arguments: `remote_system` is the host name of a remote machine on the same network. The default is the local machine. To activate the remote feature, the local and remote machines must be on the same Ethernet LAN (local area network) and the local machine must be able to get the Internet address of the remote machine (usually in the `/etc/hosts` file).

Examples:
```
acqmeter
acqmeter('nmr500')
```

See also: *NMR Spectroscopy User Guide*

Related:

acqi	Interactive acquisition display (C)
Acqmeter	Open Acqmeter window (U)

Acqmeter — Open Acqmeter window (U)

Syntax: `Acqmeter <remote_system> <-f file> <&>`

Description: Opens the Acqmeter window and shows a time line of lock level, temperature (VT), and/or spinner speed. When first opened, only lock level is displayed. By clicking anywhere in the lock level window with the right mouse button, a menu pops up with choices to close the lock level window, show a temperature (VT) window, show a spinner window, open a properties window, or close the Acqmeter window. Click on the choice desired in the menu with either the left or right mouse button. In the properties window, the host, font, color, and graphical mode can be changed. Continue to click in any Acqmeter window with the right mouse button to open the menu and then open or close windows, or close the Acqmeter window, as desired.

Arguments: `remote_system` is the host name of a remote machine on the same network. The default is the local machine. To activate the remote feature, the local and remote machines must be on the same Ethernet LAN (local area network) and the local machine must be able to get the Internet address of the remote machine (usually in the `/etc/hosts` file).

`-f file` is the name of a template file in the directory `$vnmruser/vnmrsys/templates/acqstat` used to set the attributes of the Acqmeter window when it opens. This allows customizing the Acqmeter window for different users and experiments. The default name of the file is `default`.

& (ampersand) character added to the command makes Acqmeter into a background process. For example, if “lab” is the remote machine host name, entering the command Acqmeter lab & displays the acquisition status of the “lab” remote machine as a background process. To activate the remote feature, the local and remote machines must be on the same Ethernet LAN (local area network) and the local machine must be able to get the Internet address of the remote machine (usually in the /etc/hosts file).

Examples:
```
Acqmeter &
Acqmeter nmr400 &
Acqmeter gem300 -f inova500.lisa &
```

See also: *NMR Spectroscopy User Guide*

Related:

acqi	Interactive acquisition display (C)
acqmeter	Open Acqmeter window (M)

acqmode — Acquisition mode (P)

Description: A global parameter specifying the normal acquisition mode for acquiring, locking, fid shimming, and prescan in VnmrJ.

Values:
'' (empty string) normal acquisition

'lock' lock acquisition

'fidscan' fid shimming acquisition

'prescan' prescan acquisition

See also: *VnmrJ Imaging, User Guide, NMR Spectroscopy User Guide*

acqstat — Open Acquisition Status window (M)

Syntax: acqstat<(remote_system)>

Description: Opens the Acquisition Status window, which displays acquisition information such as the current acquisition task, experiment number, spinner status, and temperature status. When the host computer is attached to a spectrometer, this window should open automatically when VnmrJ is started. In the properties window, the host, font, color, and graphical mode can be changed. For a complete description of these windows, refer to the manual *NMR Spectroscopy User Guide.*

Arguments: remote_system is the host name of a remote machine on the same network. The default is the local machine. To activate the remote feature, the local and remote machines must be on the same Ethernet LAN (local area network) and the local machine must be able to get the Internet address of the remote machine (usually in the /etc/hosts file).

Examples:
```
acqstat
acqstat('u500')
```

See also: *NMR Spectroscopy User Guide*

Related:

Acqstat	Open the Acquisition Status window (U)
showstat	Display information about status of acquisition (C,U)

Acqstat — Open Acquisition Status window (U)

Syntax: Acqstat <remote_system> <-f file> <&>

Description: Opens the Acquisition Status window, which displays acquisition information such as the current acquisition task, experiment number, spinner status, and temperature status. When the host computer is attached to a spectrometer, this

window should open automatically when VnmrJ is started. In the properties window, the host, font, color, and graphical mode can be changed. For a complete description of these windows, refer to the manual *NMR Spectroscopy User Guide.*

Arguments: `remote_system` is the host name of a remote machine on the same network. The default is the local machine. To activate the remote feature, the local and remote machines must be on the same Ethernet LAN (local area network) and the local machine must be able to get the Internet address of the remote machine (usually in the `/etc/hosts` file).

`-f file` is the name of a template file in the directory `$vnmruser/vnmrsys/templates/acqstat` used to set the attributes of the Acquisition Status window when it opens. This allows customizing the Acquisition Status window for different users and experiments. The default name of the file is `default`.

`&` (ampersand) character added to the command makes `Acqstat` into a background process. For example, if "lab" is the remote machine host name, entering the command `Acqstat lab &` displays the acquisition status of the "lab" remote machine as a background process. To activate the remote feature, the local and remote machines must be on the same Ethernet LAN (local area network) and the local machine must be able to get the Internet address of the remote machine (usually in the `/etc/hosts` file).

Examples:
```
Acqstat &
Acqstat nmr400 &
Acqstat gem300 -f inova500.lisa &
```

See also: *NMR Spectroscopy User Guide*

Related:

`Acqstat`	Open the Acquisition Status window (U)
`showstat`	Display information about status of acquisition (C,U)

`acqstatus` Acquisition status (P)

Description: Whenever `wbs`, `wnt`, `wexp`, or `werr` processing occurs, the acquisition condition that initiated that processing is available from the parameter `acqstatus`. This acquisition condition is represented by two numbers, a "done" code and an "error" code. The done code is set in `acqstatus[1]` and the error code is set in `acqstatus[2]`. Macros can take different actions depending on the acquisition condition.

The done codes and error codes are listed below and in the file `acq_errors` in `/vnmr/manual`. For example, a `werr` macro could specify special processing if the maximum number of transients is accumulated. The appropriate test in the macro would be:

```
if (acqstatus[2] = 200) then
"do special processing, e.g. dp='y' au"
endif
```

Done codes:

11. FID complete
12. Block size complete (error code indicates `bs` number completed)
13. Soft error
14. Warning
15. Hard error
16. Experiment aborted
17. Setup completed (error code indicates type of setup completed)
101. Experiment complete
102. Experiment started

Error codes:

Warnings
101. Low-noise signal
102. High-noise signal
103. ADC overflow occurred
104. Receiver overflow occurred*

Soft errors
200. Maximum transient completed for single-precision data
201. Lost lock during experiment (LOCKLOST)

300. *Spinner errors:*
301. Sample fails to spin after three attempts at repositioning
302. Spinner did not regulate in the allowed time period (RSPINFAIL)*
303. Spinner went out of regulation during the experiment (SPINOUT)*
395. Unknown spinner device specified (SPINUNKNOWN)*
396. Spinner device is not powered up (SPINNOPOWER)*
397. RS-232 cable not connected from console to spinner (SPINRS232)*
398. Spinner does not acknowledge commands (SPINTIMEOUT)*

400. *VT (variable temperature) errors:*
400. VT did not regulate in the given time `vttime` after being set
401. VT went out of regulation during the experiment (VTOUT)
402. VT in manual mode after automatic command (see Oxford manual)*
403. VT safety sensor has reached limit (see Oxford manual)*
404. VT cannot turn on cooling gas (see Oxford manual)*
405. VT main sensor on bottom limit (see Oxford manual)*
406. VT main sensor on top limit (see Oxford manual)*
407. VT sc/ss error (see Oxford manual)*
408. VT oc/ss error (see Oxford manual)*
495. Unknown VT device specified (VTUNKNOWN)*
496. VT device not powered up (VTNOPOWER)*
497. RS-232 cable not connected between console and VT (VTRS232)*
498. VT does not acknowledge commands (VTTIMEOUT)

500. *Sample changer errors:*
501. Sample changer has no sample to retrieve
502. Sample changer arm unable to move up during retrieve
503. Sample changer arm unable to move down during retrieve
504. Sample changer arm unable to move sideways during retrieve
505. Invalid sample number during retrieve
506. Invalid temperature during retrieve
507. Gripper abort during retrieve
508. Sample out of range during automatic retrieve
509. Illegal command character during retrieve*
510. Robot arm failed to find home position during retrieve*
511. Sample tray size is not consistent*
512. Sample changer power failure during retrieve*
513. Illegal sample changer command during retrieve*
514. Gripper failed to open during retrieve*
515. Air supply to sample changer failed during retrieve*
525. Tried to insert invalid sample number*
526. Invalid temperature during sample changer insert*
527. Gripper abort during insert*
528. Sample out of range during automatic insert
529. Illegal command character during insert*
530. Robot arm failed to find home position during insert*
531. Sample tray size is not consistent*
532. Sample changer power failure during insert*
533. Illegal sample changer command during insert*
534. Gripper failed to open during insert*
535. Air supply to sample changer failed during insert*
593. Failed to remove sample from magnet*
594. Sample failed to spin after automatic insert

595. Sample failed to insert properly
596. Sample changer not turned on
597. Sample changer not connected to RS-232 interface
598. Sample changer not responding*

600. *Shimming errors:*
601. Shimming user aborted*
602. Lost lock while shimming*
604. Lock saturation while shimming*
608. A shim coil DAC limit hit while shimming*

700. *Autolock errors:*
701. User aborted (ALKABORT)*
702. Autolock failure in finding resonance of sample (ALKRESFAIL)
703. Autolock failure in lock power adjustment (ALKPOWERFAIL)*
704. Autolock failure in lock phase adjustment (ALKPHASFAIL)*
705. Autolock failure, lock lost in final gain adjustment (ALKGAINFAIL)*

800. *Autogain errors.*
801. Autogain failure, gain driven to 0, reduce pw (AGAINFAIL)

Hard errors
901. Incorrect PSG version for acquisition
902. Sum-to-memory error, number of points acquired not equal to np
903. FIFO underflow error (a delay too small?)*
904. Requested number of data points (np) too large for acquisition*
905. Acquisition bus trap (experiment may be lost)*

1000. *SCSI errors:*
1001. Recoverable SCSI read transfer from console*
1002. Recoverable SCSI write transfer from console**
1003. Unrecoverable SCSI read transfer error*
1004. Unrecoverable SCSI write transfer error*

1100. *Host disk errors:*
1101. Error opening disk file (most likely a UNIX permission problem)*
1102. Error on closing disk file*
1103. Error on reading from disk file*
1104. Error on writing to disk file*

See also: *NMR Spectroscopy User Guide*

Related:		
	react	Recover from error conditions during werr processing (M)
	werr	Specify action when error occurs (C)
	werr	When error (P)

acquire — Acquire data (M)

Description: Macro to acquire data. It uses execpars to select the prep and prescan method, executes them, and then begins acquisition.

See also: *NMR Spectroscopy User Guide*

Related:		
	execpars	Set up the exec parameters (M)
	execprescan	Execute prescan macro (P)
	xmnext	Find next prescan or next experiment in study queue (M)
	xmwexp	Processing macro for end of acquisition in study queue (M)

actionid — Current study queue node id (P)

Applicability: Liquids, Imaging

Description: Specifies the currently selected study queue node id.

See also: VnmrJ Imaging, User Guide, NMR Spectroscopy User Guide

Related:

xmaction	Perform study queue action (M)
xmnext	Find next prescan or next experiment in study queue (M)
xmselect	Action when study queue node is selected (M)

activestudy — Active study name (P)

Applicability: Liquids, Imaging

Description: A global parameter that specifies the currently active study name. In the Walkup interface, it specifies the currently active automation run.

Values: `'s_20050601'` active study name

`'auto_2005.06.01'` active automation run name

`'null'` no active study or automation run

See also: VnmrJ Imaging, User Guide and NMR Spectroscopy User Guide

Related:

acquire	Acquire data (M)
autodir	Automation directory absolute pathname (P)
cqinit	Initialize liquids study queue (M)
studyid	Study identification (P)
xmaction	Perform study queue action (M)
xmselect	Action when study queue node is selected (M)

add — Add current FID to add/subtract experiment (C)

Syntax:
(1) `add<(multiplier<,'new'>)>`
(2) `add('new')`
(3) `add('trace',index)`

Description: Adds the last displayed or selected FID to the current contents of the add/subtract experiment (`exp5`). The parameters `lsfid` and `phfid` can be used to shift or phase rotate the selected FID before it is combined with the data in the add/subtract experiment. A multi-FID add/subtract experiment can be created by using the `'new'` keyword. Individual FIDs in a multi-FID add/subtract experiment can subsequently be added to using the `'trace'` keyword followed by the index number of the FID.

Arguments: `multiplier` is a value that the FID is to be multiplied by before being added to the add/subtract experiment (`exp5`). The default is 1.0.

`'new'` is a keyword to create a new FID element in a add/subtract experiment.

`'trace'` is a keyword to use the next argument (`index`) as the number of the FID to add to in an add/subtract experiment. The default is to add to the first FID in a multi-FID add/subtract experiment.

`index` is the index number of the FID to be used as a target in a multi-FID add/subtract experiment.

Examples:

```
add
add(0.75)
add('new')
add('trace',2)
```

See also: *NMR Spectroscopy User Guide*

Related:

clradd	Clear add/subtract experiment (C)
lsfid	Number of complex points to left-shift `ni` interferogram (P)
phfid	Zero-order phasing constant for `np` FID (P)
select	Select a spectrum without displaying it (C)

spadd	Add current spectrum to add/subtract experiment (C)
sub	Subtract current FID from add/subtract experiment (C)

addi — Start interactive add/subtract mode (C)

Syntax: addi

Description: Starts the interactive add/subtract mode. Before entering addi, start the process with clradd and spadd, then display a second spectrum on the screen. This may involve changing experiments, selecting a second member of an array of spectra, a different trace of a 2D spectrum, or displaying a spin simulated spectrum. The Fourier numbers (fn) *must* be the same in the two spectra to be manipulated. The width (sw) of the two spectra need *not* be identical, although adding spectra of different widths will probably not be meaningful. Having selected the second spectrum and ensuring it is in nm mode, enter addi to begin the interactive process.

After addi is invoked, spectrum 1, the spectrum selected by the spadd command, appears in the center of the display. Spectrum 2, the spectrum that was active when addi was entered, appears on the bottom. The sum or difference of these spectra appears on top of the screen. When addi is first entered, this spectrum will be the sum (1 + 2) by default. The spectra is manipulated using the mouse.

The select button toggles between different modes of control.

- When the label at the screen bottom reads "active: current", all of the parameters (except wp) control spectrum 2, and spectrum 2 can be phased, scaled, or shifted relative to spectrum 1.
- After clicking on select, the label at the screen bottom reads "active: addsub", and now all of the parameters except wp control spectrum 1.
- Clicking select again toggles the label to read "active: result", and now parameter changes affect only the sum or difference spectrum.

Note that wp always controls all spectra, because differential expansions of the two spectra are not supported. Note also that the colors of the labels change to match the colors of the different spectra.

The sum/difference spectrum displayed on the screen while addi is active is strictly a temporary display. Once all manipulations have been performed, and assuming the sum/difference is something you wish to perform further operations with (such as plotting), it must be saved into the add/subtract experiment (exp5) by clicking on save. At this point, spectrum 1, which was in the add/subtract experiment, is overwritten by the sum or difference spectrum, and addi ceases operation. In most cases, you will next want to enter jexp5 ds to display the difference spectrum on the screen, ready for further manipulation (expansion, line listing, etc.) and plotting. If you wish to continue with the add/subtract process by adding in a third spectrum, display that spectrum in the usual way and enter addi again.

See also: *NMR Spectroscopy User Guide*

Related:

clradd	Clear add/subtract experiment (C)
jexp	Join existing experiment (C)
nm	Select normalized intensity mode (C)
spadd	Add current spectrum to add/subtract experiment (C)
spmin	Take minimum of two spectra in add/subtract experiment (C)
spsub	Subtract current spectrum from add/subtract experiment (C)
wp	Width of plot in directly detected dimension (P)

addnucleus — Add new nucleus to existing probe file (M)

Applicability: ALL

Description: Entries for nuclei not in the default probe file are appended to the end of the file. The argument should correspond to a nucleus in the nuctable.

Syntax: `addnucleus('nucleus')`

Arguments: `nucleus` — name followed by atomic number, e.g. C13 not 13C.

Examples: `addnucleus('Si29')`

See also: *NMR Spectroscopy User Guide*

Related:

addprobe	Create new probe directory and probe file (M)
deletenucleus	Removes nucleus entry to probe file (M)
getparam	Receive parameter from probe file (M)
probe	Probe type (P)
setparams	Write parameter to current probe file (M)

addpar — Add selected parameters to current experiment (M)

Syntax:
```
addpar<('2d'|'3d'|'3rf'|'4d'|'downsamp'|'fid'|
    'image'|'ll2d'|'lp'<,dim>|'oversamp'|'ss')>
```

Applicability: The `'3d'`, `'3rf'`, `'4d'`, `'fid'`, and `'image'` arguments work on all systems but are only useful if system has the proper hardware.

Description: Creates selected parameters in the current experiment.

Arguments: If no argument is entered, `addpar` displays instructions for its use.

`'2d'`, `'3d'`, `'3rf'`, `'4d'`, `'downsamp'`, `'fid'`, `'image'`, `'ll2d'`, `'lp'`, `'oversamp'`, and `'ss'` are keywords (only one keyword is used at a time) specifying the parameters to be created:

- `'2d'` specifies creating ni, phase, and sw1, which can be used to acquire a 2D data set (functions the same as macro par2d).
- `'3d'` specifies creating d3, ni2, phase2, and sw2, which can used to acquire a 3D data set (functions the same as macro par3d).
- `'3rf'` specifies retrieving the ap and dg2 display templates for third rf channel and 3D parameters (functions the same as macro par3rf).
- `'4d'` specifies creating the acquisition parameters d4, ni3, phase3, and sw3, which can be used to acquire a 4D data set (functions the same as macro par4d).
- `'downsamp'` specifies creating the parameters downsamp, dscoef, dslsfrq, dsfb, and filtfile for digital filtering and downsampling (functions the same as macro pards).
- `'fid'` specifies creating FID display parameters axisf, crf, deltaf, dotflag, vpf, and vpfi if the parameter set is older and lacks these parameters (functions the same as macro fidpar).
- `'ll2d'` specifies creating th2d and xdiag for the ll2d 2D peak picking program (functions the same as macro parll2d).
- `'lp'` specifies creating lpalg, lpopt, lpfilt, lpnupts, strtlp, lpext, strtext, lptrace, and lpprint for linear prediction in the acquisition dimension (functions the same as macro parlp). The display template for the dglp macro is also created if necessary.
- `'oversamp'` specifies creating parameters def_osfilt, filtfile, oscoef, osfb, osfilt, oslsfrq, and oversamp for oversampling and digital filtering (functions the same as macro paros).

- 'ss' specifies adding parameters ssorder, ssfilter, ssntaps, and sslsfrq for time-domain solvent subtraction (functions the same as macro parfidss).

dim specifies the dimension when adding linear prediction parameters: 1 for the first implicit dimension or 2 for the second implicit dimension. Default is the acquisition dimension. Therefore, addpar('lp') creates the parameters listed above; addpar('lp',1) creates lpalg1, lpopt1, lpfilt1, lpnupts1, strtlp1, lpext1, strtext1, lptrace1, and lpprint1; and addpar('lp',2) creates lpalg2, lpopt2, lpfilt2, lpnupts2, strtlp2, lpext2, strtext2, lptrace2, and lpprint2. Each separate dimension of a multidimensional data set can have its own unique parameters.

Examples:
```
addpar
addpar('3d')
addpar('lp',1)
```

See also: *NMR Spectroscopy User Guide; VnmrJ Imaging NMR*

Related:

def_osfilt	Default value of osfilt (P)
fidpar	Add parameters for FID display in current experiment (M)
osfilt	Oversampling filter for real-time DSP (P)
par2d	Create 2D acquisition parameters (M)
par3d	Create 3D acquisition parameters (M)
par3rf	Get display templates for 3rd rf channel parameters (M)
par4d	Create 4D acquisition parameters (M)
pards	Create digital filtering and downsampling parameters (M)
parfidss	Set up parameters for time-domain solvent subtraction (M)
paros	Create oversampling and digital filtering parameters (M)
parll2d	Create parameters for 2D peak picking (M)
parlp	Create parameters for linear prediction (M)

addparams — Add parameter to current probe file (M)

Syntax: addparams(param,value,nucleus<,'tmplt'><,'system'>)

Description: Adds a new parameter and its value for a specified nucleus to the probe file or to the probe template.

Arguments:

param is the name of the parameter to be added.

value is a string with the value to be written for the parameter.

nucleus is the nucleus to add in the probe file.

'tmplt' is a keyword to add the parameter to the local template. The default is the probe file.

'system' is a keyword to add the parameter to the system-level template or probe file, provided that you have write permission to that file. The default is to add the parameter to the local template or probe file.

Examples:
```
addparams('ref_pwr','53',tn)
addparams('ref_pwx','00',dn,'tmplt')
addparams('ref_pwx2','00',dn2,'tmplt','system')
```

See also: *NMR Spectroscopy User Guide*

Related:

getparam	Receive parameter from probe file (M)
setparams	Write parameter to current probe file (M)
updateprobe	Update probe file (M)

addprobe — Create new probe directory and probe file (M)

Syntax: `addprobe(probe_name<,'stdar'|'system'><,'stdpar'>)`

Description: Creates a new probe directory and a probe file. Default nuclei included in this file are ^{1}H, ^{19}F, ^{13}C, and ^{15}N. The information is saved in the user's directory `vnmrsys/probes`.

Arguments: `probe_name` is the name to be given to the probe directory and probe file.

`'stdpar'` and `'system'` are keywords for the second and third arguments:

- If the second argument is `'stdpar'`, calibration values from the standard parameter sets (`stdpar/H1.par`, `stdpar/C13.par`, etc.) will be read and written into the probe file.
- If the second argument is `'system'` and the user has write permission into the VnmrJ system probes directory (typically `/vnmr/probes`), then a system-level probe directory will be made.
- If the second argument is `'system'` and the third argument is `'stdpar'`, then both actions in the preceding bullets will occur.
- The default is the probe file is created with all parameters initialized to zero.

Examples:
```
addprobe('idpfg')
addprobe('idpfg','stdpar')
addprobe('idpfg','system','stdpar')
```

See also: *NMR Spectroscopy User Guide; VnmrJ Walkup*

Related:

addnucleus	Add new nucleus to existing probe file (M)
deletenucleus	Removes nucleus entry to probe file (M)
getparam	Receive parameter from probe file (M)
probe	Probe type (P)
setparams	Write parameter to current probe file (M)

adept — Automatic DEPT analysis and spectrum editing (C)

Syntax: `adept<(<'noll'><,'coef'><,'theory'>)>`

Description: Automatically analyzes a set of four DEPT spectra and edits the spectra so that the spectra is arrayed as follows:

- #4 is CH_3 carbons only
- #3 is CH_2 carbons only
- #2 is CH carbons only
- #1 is all protonated carbons

Because `adept` modifies the transformed data, it should not be repeated without retransforming the data between calls. `adept` produces a text file `dept.out` in the current experiment directory, which contains the result of the analysis.

Arguments: The following keyword arguments can be supplied in any order:

`'noll'` causes the line listing to be skipped. If `'noll'` is not supplied as an argument, `adept` first performs a line listing. In that case, the threshold parameter `th` must be set properly before starting `adept`.

`'coef'` causes the combination coefficients to be printed.

`'theory'` causes theoretical coefficients to be used. The default is optimized coefficients.

Examples:
```
adept
adept('coef')
adept('theory','noll')
```

See also: *NMR Spectroscopy User Guide*

Related:

autodept	Automated complete analysis of DEPT data (M)
Dept	Set up parameters for DEPT experiment
deptproc	Process DEPT data (M)
padept	Perform adept analysis and plot resulting spectra (C)
pldept	Plot DEPT data, edited or unedited (M)
th	Threshold (P)

aexppl — Automatic plot of spectral expansion (M)

Syntax: `aexppl<(expansion_factor)>`

Description: Plots automatically expansions of given regions. Regions have to be defined first by using the region command or by using the cursors in ds.

Arguments: expansion_ factor is a spectral expansion factor in units of Hz/mm. The default is 2 Hz/mm.

Examples:
```
aexppl
aexppl(20)
```

See also: *NMR Spectroscopy User Guide*

Related:

ds	Display a spectrum (C)
region	Divide spectrum into regions (C)

ai — Select absolute-intensity mode (C)

Syntax: `ai`

Description: Selects the *absolute-intensity display mode* in which the scale is kept constant from spectrum to spectrum to allow comparison of peak heights from one spectrum to another. The alternative is the normalized-intensity display mode (nm) in which spectra are scaled so that the largest peak in the spectrum is vs mm high. The modes are mutually exclusive—the system is always in either nm or ai mode. Enter aig? to determine which mode is currently active.

See also: *NMR Spectroscopy User Guide*

Related:

aig	Absolute intensity group (P)
nm	Select normalized-intensity mode (C)
vs	Vertical scale (P)

aig — Absolute-intensity group (P)

Description: Contains the result of the ai or nm command. aig is not set in the usual way but can be queried (aig?) to determine which display mode is active.

Values: 'ai' indicates the absolute-intensity display mode is active.

'nm' indicates the normalized-intensity display mode is active.

See also: *NMR Spectroscopy User Guide*

Related:

ai	Select absolute intensity mode (C)
dmg	Display mode in directly detected dimension (P)
nm	Select normalized-intensity mode (C)
?	Display individual parameter value (C)

alfa — Set alfa delay before acquisition (P)

Description: After the final event in the pulse sequence, including any receiver gate times occurring following the final pulse, acquisition occurs after a delay. This delay includes a fixed part, `alfa`, and a variable part, `1/(beta*fb)`.

- On systems with 4-pole Butterworth filters, `beta` is `2`.
- On systems with 8-pole Butterworth (200-kHz) filters, `beta` is `3.8`.
- On systems with 8-pole elliptical filters, `beta` is `1.29`.
- On Systems with 4-pole Bessel filters, `beta` is `2.3` (only systems with 2-MHz and 5-MHz Analog-to-Digital Converter boards use this filter).

Because the total delay before acquisition is the sum of `alfa` and `1/(beta*fb)`, it is possible to shorten the delay beyond "normal" values by setting `alfa` negative (to a maximum of `1/(beta*fb)`). The macros `hoult` and `calfa` frequently result in such negative values of `alfa`.

To set `alfa` to a negative number, use either the `setvalue` command to enter a specific value of `alfa`, or use the `setlimit` command to allow entry of negative values of `alfa` directly from the keyboard.

Values: 0 to 100,000,000; in µs.

See also: *NMR Spectroscopy User Guide*

Related:

`calfa`	Recalculate `alfa` so that first-order phase is zero (M)
`fb`	Filter bandwidth (P)
`hoult`	Set parameters `alfa` and `rof2` according to Hoult (M)
`rof2`	Receiver gating time following pulse (P)
`setlimit`	Set limits of a parameter in a tree (C)
`setlp0`	Set parameters for zero linear phase (M)
`setvalue`	Set value of any parameter in a tree (C)

alock — Automatic lock control (P)

Description: Governs Autolock control following the insertion of a sample with `change` or `sample`, and following initiation of an acquisition with the `go`, `ga`, or `au`. Manual adjustment of lock power, gain, and phase is possible using the `acqi` command.

Values: Possible values are `'a'`, `'auto'`, `'n'`, `'s'`, `'samp'`, `'u'`, or `'y'`, where:

`'a'` or `'auto'` selects the optimizing Autolock function, which performs a lock capture and an automatic lock power and gain adjustment before data acquisition begins (lock phase is *not* optimized).

`'n'` leaves the lock in its current state.

`'s'` or `'samp'` selects the optimizing Autolock function, which performs a lock capture and an automatic lock power and gain adjustment before data acquisition begins (lock phase is *not* optimized) but only if the sample has just been changed.

`'u'` turns lock off so that the experiment runs unlocked.

`'y'` turns on the software Autolock function, which searches for the correct Z0 value only.

See also: *NMR Spectroscopy User Guide*

Related:

`acqi`	Interactive acquisition display process (C)
`au`	Submit experiment to acquisition and process data (C)
`change`	Submit a change sample experiment to acquisition (M)
`ga`	Submit experiment to acquisition and FT the result (C)
`gf`	Prepare parameters for FID/spectrum display in `acqi` (M)
`go`	Submit experiment to acquisition (C)

lock	Submit an Autolock experiment to acquisition (C)
sample	Submit change sample, Autoshim experiment to acquisition (M)

ampmode — Independent control of amplifier mode (P)

Description: Gives override capability over the default selection of amplifier modes. Unless overridden, the usage of rf channels determines whether the amplifier for a channel is in pulse, CW (continuous wave), or idle mode:

- Observe channel is set to the pulse mode.
- Other used channels are set to the CW mode.
- Any unused channels are set to the idle mode.

The ampmode parameter can be used to override this selection.

ampmode does not normally exist but can be created by the user with the command create('ampmode','flag').

Values: List of characters in which the mode of the first amplifier is determined by the first character, the mode of the second amplifier by the second character, and so on. For each amplifier, one of the following characters is used:

- 'c' selects CW mode.
- 'i' selects idle mode.
- 'p' selects pulse mode.
- 'd' selects default behavior.

For example, ampmode='ddp' selects default behavior for the first two amplifiers and forces the third channel amplifier into pulse mode. Additional filtering is usually required when an amplifier in the same band as the observe amplifier is placed in the CW mode.

See also: *VnmrJ User Programming*

Related:		
	create	Create new parameter in a parameter tree (C)
	dn	Nucleus for the first decoupler (P)
	tn	Nucleus for observe transmitter (P)

amptype — Amplifier type (P)

Description: Specifies the type of amplifier on each rf channel of the spectrometer. The value is set in the Spectrometer Configuration window (opened from config) using the label Type of Amplifier.

For each channel, the types are Class C, Linear Full Band, Linear Low Band, Linear Broadband, or, for the fourth channel only, Shared. Selecting Shared means that the amplifier is fully configured for the third channel, and that the fourth channel shares this amplifier with the third channel.

When a type is selected for a channel, a letter (one of the values described below) is added to the value of amptype. For example, a system already set to Linear Full Band on the observe transmitter channel and the first decoupler channel would have amptype='aa'. Selecting the third channel as Linear Low Band would set amptype='aal'. Finally, selecting Shared for the fourth channel would set amptype='aaln'.

Values: 'a' indicates the channel uses a linear full-band amplifier. A full-band amplifier has two outputs: 12 MHz to ^{31}P, and ^{19}F/^{1}H.

'b' indicates the system uses a linear broadband amplifier.

'c' indicates the system uses a class C amplifier.

'l' indicates the channel uses a linear low-band amplifier. A low-band amplifier has one output from 12 MHz to ^{31}P only.

'n' indicates the fourth channel shares a linear amplifier with the third.

See also: *NMR Spectroscopy User Guide*, *VnmrJ User Programming*

Related: config Display current configuration and possibly change it (M)

analyz — Calculate standard peak height (M)

Syntax: analyz($option,$title)

Description: Macro to calculate average peak height and standard deviation and/or average phase and standard deviation.

Arguments: $option ='n' for amplitude and phase, 'a' for amplitude only, and 'p' for phase only. The $title option puts a title on the plot.

Examples: analyz – Does analysis for both amplitude and phase
analyz('p') – Does analysis for phase only
analyz('n','Stability') – Does analysis for amplitude and phase and puts title “Stability” on the plot.

analyze — Generalized curve fitting (C)

Syntax: (curve fitting) analyze('expfit',xarray<,options>)
(regression) analyze('expfit','regression'<,options>)

Description: Provides interface to curve fitting program expfit (using the curve fitting syntax), supplying expfit with input data in the form of the text file analyze.inp in the current experiment. expfit can be called from UNIX with the syntax:

```
expfit options <analyze.inp >analyze.list
```

expfit does a least-squares curve fitting to the data supplied in analyze.inp. Macros are available for the specialized uses of analyze, such as the 'T1' and 'kinetics' options. These macros avoid the need to select options and get the correct file format.

In the regression mode (using the regression syntax above), the type of curve fitting, ('poly1',...) must be selected. The regression section in the manual *NMR Spectroscopy User Guide* gives the input file format and describes the menus that permit choices indirectly through menu buttons.

The text file analyze.inp for the options 'T1', 'T2', 'kinetics', 'contact_time', and 'regression' contains the following lines (note that (1), (2), (3), etc. do not appear in the file but are used to identify lines in the explanation):

```
(1)   <text line>
(2)   <text line>
(3)   npeaks npairs <xscale> <yscale>
(4)   <NEXT npairs1>
(5)   peaks
(6)   x y
(6)   x y
   ...
(4)   <NEXT npairs2>
(5)   peaks
(6)   x y
(6)   x y
   ...
```

Line-by-line explanation:

(1) Optional descriptive text line, for regression only. Omit line otherwise.

(2) Optional *y*-axis title, for regression only. Omit line otherwise.

(3) Line containing an integer for the number of peaks (npeaks) followed by another integer for the number of (x,y) pairs per peak (npairs). If regression, the *x*-scale type and *y*-scale type are also listed.

(4) In the regression mode, a line beginning with the keyword NEXT is inserted at the start of each data set when the number of pairs per peak is variable. In this case, the number of (x,y) pairs for the peak (npair1, npair2, etc.) is also given on the line.

(5) Peak index.

(6) Data pairs, one to a line, are listed by peak in the following order:

```
x y     (first peak, first pair)
x y     (first peak, second pair)
...
x y     (second peak, first pair)
x y     (second peak, second pair)
...
```

In the regression mode, the line beginning with NEXT is inserted at the start of the data for each peak when the number of pairs per peak is variable. In this case, the header contains the maximum number of pairs for any peak.

For 'T1', 'T2', 'kinetics', and 'contact_time', information from the file fp.out and values of the arrayed parameter xarray are used to construct the file; thus, it is necessary to run fp prior to analyze.

For regression, analyze.inp is made by running expl('regression'). If the regression mode is not selected, analyze.inp may be slightly different.

In addition to output to the standard output, which is usually directed to analyze.list, expfit makes a file analyze.out, which is used by expl to display the results of the analysis.

User-supplied analysis programs can be called by analyze in place of expfit. Such programs should read their input from stdin and write the output listing to stdout. No analyze.out file needs to be generated unless display by expl is desired. Use the program expfit as a model.

Arguments: 'expfit' is a required first argument.

xarray is the name of the parameter array holding x-values in 'T1', 'T2', 'kinetics', and 'contact_time', and is used only with these options.

'regression' sets regression mode and signifies generalized curve fitting with choices 'poly1', 'poly2', 'poly3', and 'exp'.

options are any of the following keywords:

- 'T1' sets T_1 analysis (the default).
- 'T2' sets T_2 analysis.
- 'kinetics' sets kinetics analysis, with decreasing peak height.
- 'increment' sets kinetics analysis, with increasing peak height.
- 'list' makes an extended listing for each peak.
- 'diffusion' sets a special analysis for diffusion experiments.
- 'contact_time' sets a special analysis for solids cross-polarization spin-lock experiments.
- 'poly1' sets a linear fitting. It is used in regression mode only.
- 'poly2' sets a quadratic fitting. It is used in regression mode only.
- 'poly3' sets a cubic fitting It is used in regression mode only.
- 'exp' sets exponential curve fitting. It is used in regression mode only.

Examples:
```
analyze('expfit','d2','T1','list')
analyze('expfit','pad',kinetics','list')
analyze('expfit','p2','contact_time','list')
analyze('expfit','regression','poly1','list')
```

See also: *NMR Spectroscopy User Guide*

Related:

contact_time	MAS cross-polarization spin-lock contact time (M)
expfit	Least squares fit to polynomial or exponential curve (U)
expl	Display exponential or polynomial curves (C)
pexpl	Plot exponential or polynomial curves (C)
kini	Kinetics analysis, increasing intensity (M)
t1	T_1 exponential analysis (M)
t2	T_2 exponential analysis (M)

ap — Print out "all" parameters (C)

Applicability: VnmrJ

Syntax: `ap('template_name',<'filename'>)`

Description: Print a parameter list. The *User Programming* Manual describes the rules for building a template for the ap commands. The string parameter ap normally controls how the command, ap, displays the parameters. Use command paramvi('ap') to modify the ap parameter. The ap command writes the parameter list to a file if filename is provided as the second argument.

Arguments: `template_name` template name must be the first argument.

`filename` optional, name of file to which the parameters are written.

Examples: `ap('ap','apout')` — writes the parameter list using defined by the ap parameter to the file apout.

```
ap('newap')
```

See also: *NMR Spectroscopy User Guide; VnmrJ User Programming*

Related:

addpar	Add selected parameters to the current experiment (M)
ap	"All" parameters display control (P)
dg	Display group of acquisition/processing parameters (C)
hpa	Plot parameters on special preprinted chart paper (C)
pap	Plot out "all" parameters (C)
paramvi	Edit a variable and its attributes with vi text editor (C)
ppa	Plot a parameter list in "English" (M)

ap — "All" parameters display control (P)

Description: Controls the display of the ap and pap commands to print and plot a parameter list. Use paramvi('ap') to modify the string value of ap.

See also: *NMR Spectroscopy User Guide*; *VnmrJ User Programming*

Related:

ap	Print out "all" parameters (C)
dg	Display group of acquisition/processing parameters (C)
pap	Plot out "all" parameters (C)
paramvi	Edit a variable and its attributes with vi text editor (C)

apa — Plot parameters automatically (M)

Syntax: `apa`

Description: Selects automatically the appropriate command on different plotter devices to plot the parameter list.

See also: *VnmrJ User Programming*

Related:
- hpa — Plot parameters on special preprinted chart paper (C)
- ppa — Plot a parameter list in “English” (M)

aph — Automatic phase adjustment of spectra (C)

Syntax: `aph<:$ok,$rp,$lp>`

Description: Automatically calculates the phase parameters `lp` and `rp` required to produce an absorption mode spectrum and applies these parameters to the current spectrum. Values calculated do *not* depend on the initial values of `lp` and `rp`.

Arguments: `$ok` is 1 if the phase adjustment succeeds, or 0 if the adjustment fails.

`$rp` is the calculated value of `rp`. If `$rp` is requested as a return value, `rp` is returned but not applied to the current spectrum.

`$lp` is the calculated value of `lp`. If `$lp` is requested as a return value, `lp` is returned but not applied to the current spectrum.

See also: *NMR Spectroscopy User Guide*

Related:
- aph0 — Automatic phase of zero-order term (C)
- aphx — Perform optimized automatic phasing (M)
- lp — First-order phase in directly detected dimension (P)
- rp — Zero-order phase in directly detected dimension (P)

aph0 — Automatic phase of zero-order term (C)

Syntax: `aph0<:$ok,$rp,$lp>`

Description: Automatically adjusts only the zero-order frequency-independent term `rp` and does not rely on the frequency-dependent term `lp` being previously adjusted. In favorable circumstances, spectra may be obtained in such a way that only `rp` is expected to change. In these cases, if `lp` has been determined for one spectrum, then `rp` only can be computer-adjusted for subsequent spectra by `aph0` (“aph-zero”). Note that `aph0` does not correctly phase an exactly on-resonance peak.

Arguments: `$ok` is 1 if the phase adjustment succeeds, or 0 if the adjustment fails.

`$rp` is the calculated value of `rp`.

`$lp` is the current value of `lp`.

See also: *NMR Spectroscopy User Guide*

Related:
- aph — Automatic phase adjustment of spectra (C)
- aphx — Perform optimized automatic phasing (M)
- lp — First-order phase in directly detected dimension (P)
- rp — Zero-order phase in directly detected dimension (P)

aphb — Auto phasing for Bruker data (C)

Syntax: `aphb<(threshold)>`

Description: Phases Bruker data using the autophasing program.

Arguments: `threshold` determines if a data point is large enough to qualify it as part of a peak. If no argument is given, or if the value is equal to or less than 0, the threshold is calculated from the spectrum.

Examples:
```
aphb
aphb(2)
```

See also: *NMR Spectroscopy User Guide*

Related:
- `aph` Automatic phase adjustment of spectra (C)
- `aph0` Automatic phase of zero-order term only (C)

aphx — Perform optimized automatic phasing (M)

Syntax: `aphx`

Description: Optimizes parameters and arguments for the `aph` command. `aphx` first performs an `aph` then calculates a theoretical value for `lp`. If `lp` set by the `aph` is different from the calculated value by 10 per cent, the calculated value is used and an `aph0` is performed.

See also: *NMR Spectroscopy User Guide*

Related:
- `aph` Automatic phase adjustment of spectra (C)
- `aph0` Automatic phase of zero-order term only (C)
- `lp` First order phase along directly detected dimension (P)

appdirs — Starts Applications Directory Editor (M)

Applicability: ALL

Syntax: `appdirs`

Description: The **appdirs** macro brings up an editor to set the applications directories.The top section of the editor has rows consisting of a menu and two entry boxes.

Values: **Menu selections**:

Enabled — enable an application directory.

Disabled — disable an application directory.

Remove(d) — initial setting for other row and the and empty entry boxes.

Set an application directory menu to Remove(d) to completely remove it.

Fields in each row:

Applications directory path.

A comment can be added to the second entry box.

Radio-button choices:

Save as private applications directories — sets the applications directories for the current operator only.

Reset to system default applications directories — removes any private applications directories and return to the standard default set.

Save the applications directories for global use — available only to users with write permission for VnmrJ system files. A name must be provided for this choice. This will affect all users the administrator has set that name as their appdirs setting. The Varian default names are Experimental, Walkup, Imaging, and LcNmrMs.

Buttons:

OK — exit the editor and apply the selections made in the editor.

Cancel — exit the editor and abort the editor session, making no changes to the applications directories.

See also: *VnmrJ Installation and Administration*

Related:
- `exists` Checks if parameter, file, or macro exists and file type (C)

A

appmode — Application mode (P)

Description: A global parameter that allows selection of specialized system applications modes, such as imaging, by setting the global parameters `sysmaclibpath`, `sysmenulipath`, and `syshelppath`.

For example, in `/vnmr/maclib` is a subdirectory `maclib.imaging` that contains macros used primarily with imaging applications. Similarly, in `/vnmr/menulib` is a subdirectory `menulib.imaging` for imaging- related menus. By separating the imaging macros and menus into subdirectories, access to imaging-specific macros and menus is more convenient. This separation also allows minor modifications to some macros and menus while retaining the names that are in common use or required by other VnmrJ commands.

The value of `appmode` are set from either the System settings dialog in the Utilities menu or the VnmrJ Admin interface.

Values: `'standard'` sets standard application mode.
`'imaging'` sets imaging application mode.
`'autotest'` sets autotest application mode

apptype — Application type (P)

Description: Specifies the application type, the group of pulse sequences to which a pulse sequence belongs. It is used by the `execpars` macros to specify the actions executed by the protocol for a pulse sequence. The actions are common to the group of pulse sequences specified by the `apptype`.

Values: See the `execpars` directory in `/vnmr`.

See also: *VnmrJ Imaging, User Guide* and *NMR Spectroscopy User Guide*

Related:

`cqexp`	Load experiment from protocol (M)
`execpars`	Set up the exec parameters (M)
`execsetup`	Execute setup macro (P)
`execprep`	Execute prepare macro (P)
`execprescan`	Execute prescan macro (P)
`execpreocess`	Execute processing macro (P)
`execplot`	Execute plotting macro (P)
`sqexp`	Load experiment from protocol (M)

Apt — Set up parameters for APT experiment (M)

Description: Converts a parameter set to the APT (attached proton test) experiment.

See also: *NMR Spectroscopy User Guide*

Related:

`aptaph`	Automatic processing for APT spectra (M)
`capt`	Automated carbon and APT acquisition (M)
`hcapt`	Automated proton, carbon, and APT acquisition (M)

aptaph — Automatic processing for APT spectra (M)

Syntax: `aptaph`

Description: Automatically phases APT spectra.

See also: *NMR Spectroscopy User Guide*

Related:

`Apt`	Set up parameters for APT pulse sequence (M)

array — Easy entry of linearly spaced array values (M)

Syntax: `array<(parameter<,number_steps,start,step_size)>`

Description: Arrays a parameter to the number of steps, starting value and step size given by the user. All values of the array will satisfy the limits of the parameter.

If `array` is typed with none or only some of its arguments, you enter an interactive mode in which you are asked for the missing values.

Arguments: `parameter` is the name of the parameter to be arrayed. The default is an interactive mode in which you are prompted for the parameter. Only numeric parameters can be arrayed.

`number_steps` is the number of values of the parameter. The default is an interactive mode in which you are prompted for the number of steps.

`start` is the starting value of the parameter array. The default is an interactive mode in which you are prompted for the starting value.

`step_size` is the magnitude of the difference between elements in the array. The default is an interactive mode in which you are prompted for the step size.

Examples:
```
array
array('pw')
array('tof',40,1400,-50)
```

See also: *NMR Spectroscopy User Guide*

`array` Parameter order and precedence (P)

Description: Whenever an array of one or more parameters is set up, the string parameter `array` tells the system the name of the parameter or parameters that are arrayed and the order and precedence in which the arraying is to take place. The parameter `array` is automatically updated when acquisition parameters are set. "Diagonal arrays" (those corresponding to using parentheses in the parameter `array`) must be entered by hand.

Values: `''` (two single quotes with no space between) indicates no parameter is arrayed.

`'x'` indicates the parameter `x` is arrayed.

`'x,y'` indicates the parameters `x` and `y` are arrayed, with `y` taking precedence. That is, the order of the experiments is x_1y_1, x_1y_2,... x_1y_n, x_2y_1, x_2y_2,... x_2y_n,... x_my_n, with a total of $m \times n$ experiments being performed.

`'y,x'` indicates the parameters `x` and `y` are arrayed, with `x` taking precedence. That is, the order of the experiments is x_1y_1, x_2y_1,... x_ny_1, x_1y_2, x_2y_2,... x_my_2,... x_my_n, with total of $m \times n$ experiments being performed.

`'(x,y)'` indicates the parameters `x` and `y` are jointly arrayed. The number of elements of the parameters `x` and `y` must be identical, and the order of experiments is x_1y_1, x_2y_2,... x_ny_n, with `n` experiments being performed.

Joint arrays can have up to 10 parameters. Regular multiple arrays can have up to 20 parameters, with each parameter being either a simple parameter or a diagonal array. The total number of elements in all arrays can be 2^{32}–1.

See also: *NMR Spectroscopy User Guide*

Related:
- `array` Easy entry of linearly spaced array values (M)

`arraydim` Dimension of experiment (P)

Description: After `calcdim` calculates the dimension of an experiment, the result is put into the parameter `arraydim`. If an experiment is arrayed, `arraydim` is the product of the size of the arrays.

See also: *NMR Spectroscopy User Guide*

Related:
- `calcdim` Calculate dimension of experiment (C)
- `celem` Completed FID elements (P)

A

asin — Find arc sine of number (C)

Syntax: `asin(value)<:n>`

Description: Finds the arc sine (also called the inverse sine) of a number.

Arguments: `value` is a number in the range of ±1.0.

`n` is a return argument giving the arc sine, in radians, of `value`. The default is to display the arc sine value in the status window.

Examples:
```
asin(.5)
asin(val):asin_val
```

See also: *VnmrJ User Programming*

Related:

`sin`	Find sine value of an angle (C)

asize — Make plot resolution along f_1 and f_2 the same (M)

Syntax: `asize`

Description: Adjusts the 2D display parameters (`sc`, `wc`, `sc2`, and `wc2`) so that the displayed resolution along both f_1 and f_2 is the same. It is not suggested for heteronuclear experiments where the chemical shift spread of one nucleus is much greater than that of the other.

See also: *NMR Spectroscopy User Guide*

Related:

`sc`	Start of chart (P)
`sc2`	Start of chart in second direction (P)
`wc`	Width of chart (P)
`wc2`	Width of chart in second direction (P)

assign — Assign transitions to experimental lines (M)

Syntax:
(1) `assign<('mark')>`
(2) `assign(transistion_number,line_number)`

Description: Assigns the nearest calculated transition to the lines from a `dll` or `nll` listing after `spinll` has placed them in `slfreq`. All lines may not be assigned and transitions must be greater than `sth`. The next `spins('iterate')` determines new parameters to minimize the differences in position of the assigned pairs.

Arguments: `'mark'` makes assign use the lines selected with the mark button in place of `dll`. The results of the `mark` operation are stored in the file `mark1d.out`, which is cleared by the command `mark('reset')`.

`transition_number` is a single calculated transition number that is assigned to a line from the `dll` listing.

`line_number` is the index of the line from the `dll` listing. Setting `line_number=0` removes an assignment from a calculated transition.

Examples:
```
assign
assign('mark')
assign(4,0)
```

See also: *NMR Spectroscopy User Guide*

Related:

`dll`	Display listed line frequencies and intensities (C)
`mark`	Determine intensity of the spectrum at a point (C)
`nll`	Find line frequencies and intensities (C)
`slfreq`	Measured line frequencies (P)
`spinll`	Set up `slfreq` array (M)

spins	Perform spin simulation calculation (C)
sth	Minimum intensity threshold (P)

at — Acquisition time (P)

Description: Length of time during which each FID is acquired. Since the sampling rate is determined by the spectral width sw, the total number of data points to be acquired (2*sw*at) is automatically determined and displayed as the parameter np. at can be entered indirectly by using the parameter np.

Values: Number, in seconds. A value that gives a number of data points that is not a multiple of 2 is readjusted automatically to be a multiple of 2.

See also: *NMR Spectroscopy User Guide; VnmrJ User Programming*

Related:

np	Number of data points (P)
sw	Spectral width in directly detected dimension (P)

atan — Find arc tangent of a number (C)

Syntax:
```
atan(value)<:n>
```

Description: Finds the arc tangent (also called the inverse tangent) of a number.

Arguments: value is a number between π/2 and –π/2.

n is a return argument giving the arc tangent, in radians, of value. The default is to display the arc tangent value in the status window.

Examples:
```
atan(.5)
atan(val):atan_val
```

See also: *VnmrJ User Programming*

Related:

sin	Find sine value of an angle (C)

atan2 — Find arc tangent of two numbers (C)

Syntax:
```
atan2(y,x)<:n>
```

Description: Finds the arc tangent (also called the inverse tangent) of the quotient of two numbers.

Arguments: y and x are two numbers, where the quotient y/x is between π/2 and –π/2 and x is not equal to zero.

n is a return argument giving the arc tangent, in radians, of y/x. The default is to display the arc tangent value in the status window.

Examples:
```
atan2(1,2)
atan2(val):atan2_val
```

See also: *VnmrJ User Programming*

Related:

sin	Find sine value of an angle (C)

atcmd — Call a macro at a specified time (M)

Description:
```
atcmd<(<'macro'><,'timespec'><,'day'><,'cancel'>)>
```

Syntax: Calls a macro at the specified time. It only functions on a spectrometer. A background VnmrJ is started to execute the command. This background VnmrJ is not started in an experiment; therefore, the macro executes a jexp or runs commands or macros that do not need experiment parameters. It will have access to global and system global parameters.

Arguments: When called with arguments, atcmd updates the database with the supplied information. It does not start the process that calls the macros at the specified times. atcmd with no arguments starts the program that calls the macros at the specified times.

timespec -- has the format hh:mm <mon tue wed thur fri sat sun> A 24 hour clock is used -- midnight is 0:0, noon is 12:00.

day -- If the optional day field is used, the command will be repeated on that day at the appointed time. The day fields are case insensitive. For monday, wednesday, and friday only a single character is needed. More can be used. For tuesday, thursday, saturday, and sunday, at least two characters must be given.

cancel -- If the cancel argument is given, it will cancel all the commands that match the supplied macro. For example, if you specify cmda to be run at 8:00 on mon and 9:00 on tue, then atcmd('cancel','cmda') will cancel both of them. If the macro is '', the cancel option will cancel all atcmd macros.

list -- The list argument lists the timespec for all the atcmds that match the supplied macro. If the macro is '', the list option lists all of the atcmd macros and their timespecs. Optional arguments can be returned. The first is the number of atcmds. The macro and timespec for each atcmd can be returned.

When the command specified by atcmd is executed in background, it will be executed using the environment of the user who requested the atcmd. Also, the background VnmrJ will initially not be joined to a specific experiment.

Examples:

```
atcmd('echo(`good morning`)','8:00 mon tue wed thu fri')
```
Displays a welcome message every weekday at 8:00 am.

```
atcmd('echo(`What are you doing here on a weekend?`)','8:00 Sat Sun')
```
Questions your intentions on the weekend.

```
atcmd('startNightQueue','22:00')
```
Runs the macro startNightQueue at 22 hr. (10:00pm).

```
atcmd('startNightQueue','cancel')
```
Cancels the scheduled startNightQueue cmd

```
atcmd('','cancel')
```
Cancels all scheduled commands

```
atcmd('','list')
```
Lists all scheduled commands

atext — Append string to current experiment text file (M)

Syntax: `atext(string)`

Description: Adds a line of text to the current experiment text file.

Arguments: string is a single line of text.

Examples: `atext('T1 Experiment')`

See also: *NMR Spectroscopy User Guide*

Related:

ctext	Clear the text of the current experiment (C)
text	Display text or set new text for current experiment (C)
write	Write formatted text to a device (C)

attval — Calculate pulse width (M)

Syntax: `attval (pw,tpwr)`

Description: Calculates the pulse width and B_1 field at every transmitter power. A low transmitter power should be used where the amplifier is not in compression. Calculation is not valid where amplifier is in compression.

Arguments: `pw` is the pulse width.
`tpwr` is the transmitter power.

Examples: `attval(7.0,59)`

atune — ProTune Present (P)

Description: Hardware configuration parameter specifying if ProTune is or is not present. Parameter is set in the System Configuration window.

Arguments: `'y'` ProTune is present
`'n'` ProTune not is present

See also: *VnmrJ Installation and Administration*

Related:

`wtune`	Specify when to tune (P)
`tupwr`	Transmitter power used in tuning (P)

au — Submit experiment to acquisition and process data (M)

Syntax: `au<(<'nocheck'><,'next'><,'wait'>)>`

Description: Performs the experiment described by the current acquisition parameters, checking the parameters `loc`, `spin`, `gain`, `wshim`, `load`, and `method` to determine the necessity to perform various actions in addition to simple data acquisition. This may involve a single FID or multiple FIDs, as in the case of arrays or 2D experiments. `au` causes the data to automatically be processed according to the following parameters:

- `wbs` specifies what happens after each block.
- `wnt` specifies what happens after each FID is collected.
- `wexp` specifies what happens when the entire acquisition is complete (which may involve several complete FIDs in the case of 1D arrays or 2D experiments).

Before starting the experiment, `au` executes the two user-created macros if they exist. The first is `usergo`, a macro that allows the user to set up general conditions for the experiment. The second is a macro whose name is formed by `go_` followed by the name of the pulse sequence (from `seqfil`) to be used (e.g., `go_s2pul`, `go_dept`). This macro allows a user to set up experiment conditions suited to a particular sequence.

Arguments: `'nocheck'` is a keyword to override checking if there is insufficient free disk space for the complete 1D or 2D FID data set to be acquired.

`'next'` is a keyword to put the experiment started with `au('next')` at the head of the queue of experiments to be submitted to acquisition.

`'wait'` is a keyword to stop submission of experiments to acquisition until `wexp` processing of the experiment, started with `au('wait')`, is finished.

Examples:
```
au
au('wait')
```

See also: *NMR Spectroscopy User Guide*

Related:

`auto_au`	Controlling macro for automation (M)
`change`	Submit a change sample experiment to acquisition (M)
`ga`	Submit experiment to acquisition and FT the result (M)
`gain`	Receiver gain (P)
`go`	Submit experiment to acquisition (M)

go_	Pulse sequence setup macro called by go, ga, and au (M)
load	Load status of displayed shims (P)
loc	Location of sample in tray (P)
lock	Submit an Autolock experiment to acquisition (C)
method	Autoshim method (P)
sample	Submit change sample, Autoshim experiment to acquisition (M)
seqfil	Pulse sequence name (P)
shim	Submit an Autoshim experiment to acquisition (C)
spin	Submit a spin setup experiment to acquisition (C)
spin	Sample spin rate (P)
su	Submit a setup experiment to acquisition (M)
usergo	Experiment setup macro called by go, ga, and au (M)
wbs	Specify action when bs transients accumulate (C)
wexp	Specify action when experiment completes (C)
wnt	Specify action when nt transients accumulate (C)
wshim	Conditions when shimming is performed (P)

AuCALch3i — Set up autocalibration with CH3I sample (M)

Syntax: AuCALch3i

Description: Retrieves standard proton parameter set and setup for automatic calibration of proton (observe and decouple), carbon (observe and decouple), gcal, and C/H gradient ratio. The AuCALch3i macro is the same as the AuCALch3i1 macro.

AuCALch3i1 — Get autocalibration with CH_3I sample (M)

Syntax: AuCALch3i1

Description: Retrieves standard proton parameter set and setup for automatic calibration of proton (observe and decouple), carbon (observe and decouple), gcal, and C/H gradient ratio. The AuCALch3i1 macro is the same as the AuCALch3i macro.

AuCALch3oh — Set up autocalibration with Autotest sample (M)

Syntax: AuCALch3oh

Description: Retrieves standard proton parameter set and setup for automatic calibration of proton (observe), carbon (decouple), gcal and C/H gradient ratio. The AuCALch30h macro is the same as the AuCALch30h1 macro.

AuCALch3oh1 — Get autocalibration with Autotest sample (M)

Syntax: AuCALch3oh1

Description: Retrieves standard proton parameter set and setup for automatic calibration of proton (observe), carbon (decouple), gcal and C/H gradient ratio. The AuCALch30h1 macro is the same as the AuCALch30h macro.

Aucalibz0 — Automatic Hz to DAC calibration for Z0 (M)

Applicability: Autocalibration routine

Syntax: Called by Augmapz0 calibration routine.

Description: Called by `Augmapz0` calibration routine. Automatically calibrates lock frequency change per Z0 DAC unit change. The calibrated value is written out in the probe file as `lkhzdac` parameter

See also: *System Administration*.

Related:

`Augmapz0`	Automatic lock gradient map generation and Z0 calibration (M)
`Aufindz0`	Automatic adjustment of Z0 (M)

`AuCdec` Carbon decoupler calibration macro (M)

Syntax: `AuCdec`

Description: Used by `AuCALch3i` and `AuCALch3oh` autocalibration routines to do carbon decoupler calibrations. Calibrates high-power pulse widths and `dmf`.

See also: *System Administration*

Related:

`AuCALch3i`	Get autocalibration with CH_3I sample (M)
`AuCALch3oh`	Get autocalibration with Autotest sample (M)
`dmf`	Decoupler modulation frequency for first decoupler (P)

`AuCgrad` Carbon/proton gradient ratio calibration macro (M)

Syntax: `AuCgrad`

Description: Used by `AuCALch3i1` and `AuCALch3oh1` autocalibration routines for C/H gradient ratio calibrations.

See also: *System Administration*

Related:

`AuCALch3i1`	Get autocalibration with CH_3I sample (M)
`AuCALch3oh1`	Get autocalibration with Autotest sample (M)

`AuCobs` Carbon observe calibration macro (M)

Syntax: `AuCobs`

Description: Used by `AuCALch3i1` autocalibration routines for carbon observe calibrations.

See also: *System Administration*

Related:

`AuCALch3i1`	Get autocalibration with CH_3I sample (M)

`audiofilter` Audio filter board type (P)

Description: Sets the type of audio filter board used where the spectral width (`sw`) is less than 100 kHz. The filter type is set in the Spectrometer Configuration window (opened from `config`) using the label Audio Filter Type.

Values: `'b'` indicates the system has a 100-kHz Butterworth filter board (100 kHz Butterworth choice in the Spectrometer Configuration window.).

`'e'` indicates the system has a 100-kHz elliptical filter board (100 kHz Elliptical choice in the Spectrometer Configuration window).

`'2'` indicates the system has a 200-kHz Butterworth filter board (200 kHz Butterworth choice in the Spectrometer Configuration window).

`'5'` indicates the system has a 500-kHz elliptical filter board (500 kHz Elliptical choice in the Spectrometer Configuration window).

See also: *System Administration*

Related:

`config`	Display current configuration and possibly change it (M)
`sw`	Spectral width in directly detected dimension (P)

A

Aufindz0 — **Automatic adjustment of Z0 (M)**

Syntax: Aufindz0

Description: Finds z0 by doing lock 1D spectrum. The frequency is then used along with the lkhzdac value in the probe file to calculate the z0 value for a given solvent and autolocking is done. This requires previous calibration of the hzdac value done using the Aucalibz0 macro.

See also: *System Administration*

Related:
- Aucalibz0 — Automatic Hz to DAC calibration for Z0 (M)

Augcal — **Probe gcal calibration macro (M)**

Syntax: Augcal

Description: Used by AuCALch3i1 and AuCALch3oh1 autocalibration routines for probe gcal calibrations.

See also: *System Administration*

Related:
- AuCALch3i1 — Get autocalibration with CH_3I sample (M)
- AuCALch3oh1 — Get autocalibration with Autotest sample (M)
- gcal — Gradient calibration constant (P)

Augmap — **Automated gradient map generation (M)**

Syntax: Augmap

Description: Automatically adjusts gradient level, offset, window, and pulse width to generate a z1–z4 gradient map using a 2-Hz D_2O sample. This macro is used by the Aumakegmap auto gradient map generation macro and is applicable only for a lock gradient map.

See also: *System Administration*

Related:
- Aumakegmap — Auto lock gradient map generation (M)
- gsize — Number of z-axis shims used by gradient shimming (P)

Augmapz0 — **Automatic lock gradient map generation and z0 calibration (M)**

Syntax: Augmapz0

Description: Using the 2-Hz D_2O sample, the augmapz0 macro automatically creates a lock gradient map, followed by Hz to DAC calibration of Z0 for the autolocking procedure.

See also: *System Administration*

Related:
- Aucalibz0 — Automatic Hz to DAC calibration for Z0 (M)
- Aufindz0 — Automatic adjustment of Z0 (M)

AuHdec — **Proton decoupler calibration (M)**

Syntax: AuHdec

Description: Used by AuCALch3i autocalibration routine to do proton decoupler calibrations. Calibrates high-power pulse widths and dmf.

See also: *System Administration*

Related:
- AuCALch3i — Get autocalibration with CH3I sample (M)
- dmf — Decoupler modulation frequency for first decoupler (P)

AuHobs **Proton observe calibration macro (M)**

Syntax: AuHobs

Description: Used by AuCALch3i and AuCALch3oh autocalibration routines for proton observe calibrations.

Aumakegmap **Auto lock gradient map generation (M)**

Syntax: Aumakegmap(<lk or hs or H1>)

Description: Generates z1–z4 lock gradient ('lk' argument), lock homospoil ('hs' argument), or ^{1}H gradient map ('H1' argument). If no argument is given, the defaults is 'lk', if gradtype='nnh' to 'hs'. The doped 2-Hz D_2O should be used for hs and lk maps. H1 map is typically done on the sample. Automatically adjusts gradient level, offset, window, and pulse width. The map name is automatically stored in the probe file.

AuNuc **Get parameters for a given nucleus (M)**

Syntax: AuNuc(nucleus,solvent)

Description: Retrieves standard parameter set for a given nucleus and adds all required parameters for Tcl/dg driven parameters. If no parameter set exists in stdpar, then carbon parameters are retrieved and tn changed.

auto **Prepare for an automation run (C)**

Applicability: Systems with an automatic sample changer.

Syntax: auto<(automation_directory)>

Description: Prepares the automation directory for an automation run. auto aborts if the spectrometer is already in automation mode.

Arguments: automation_directory is the name of the automation directory, either an absolute UNIX path (i.e.the first character is a "/") or a relative path (the first character is not a "/"). The default is the value of the parameter autodir. If for some reason autodir is not defined, you are prompted to provide the location of the automation directory. If not given as an argument, you are prompted for the path. If the automation directory is not present, it is created with full access for all users. auto aborts if it fails to create this directory.

Examples:
```
auto
auto('/home/vnmr1/autorun_620')
```

See also: *NMR Spectroscopy User Guide, VnmrJ User Programming, VnmrJ Walkup*

Related:

auto_au	Controlling macro for automation (M)
autodir	Automation directory absolute pathname (P)
autogo	Start an automation run (C)
autoname	Prefix for automation data file (P)

auto **Automation mode active (P)**

Applicability: Systems with an automatic sample changer.

Description: A global variable that shows whether or not an automation run is in progress. Macros typically test this parameter because actions can differ between the automation and non-automation modes. The value of auto is not enterable by the user. An automation experiment is initiated with the autogo command. The auto parameter is only set to 'y' for those macros and commands that are run as part of an automation experiment.

Values: 'y' indicates automation mode is active.

'n' indicates automation mode is inactive

See also: *NMR Spectroscopy User Guide*, *VnmrJ User Programming*, *VnmrJ Walkup*.

Related:

auto_au	Controlling macro for automation (M)
autogo	Start an automation run (C)
autora	Resume suspended automation run (C)
autosa	Suspend current automation run (C)

auto_au — Controlling macro for automation (M)

Applicability: Systems with an automatic sample changer.

Syntax: auto_au

Description: Reads sampleinfo file (defines an automation experiment) using the lookup facility, sets the solvent and loc parameters based on the SOLVENT and SAMPLE# fields of sampleinfo, runs exec on the entry in the MACRO field, and writes the experiment text based on the TEXT field. After that, auto_au examines the value of the wexp parameter:

- If wexp is set to 'procplot', then auto_au calls au.
- If wexp is set to 'autolist', then auto_au inserts 'auto' as the first argument to autolist and calls au('wait').
- If wexp is set to anything else, auto_au does not call au.

If no data is generated from the requested MACRO field, due to an error or some other reason, auto_au sets the STATUS field to "No Data Requested."

auto_au is used only during automation and should not be called directly. It provides a starting point for all automation experiments. As such, it is a convenient point for user customization of automation.

See also: *NMR Spectroscopy User Guide*, *VnmrJ User Programming*, *VnmrJ Walkup*

Related:

au	Submit experiment to acquisition and process data (M)
auto	Prepare for an automation run (C)
autolist	Set up and start chained acquisition (M)
exec	Execute a VnmrJ command (C)
loc	Location of sample in tray (P)
lookup	Look up words and lines from a text file (C)
solvent	Lock solvent (P)
wexp	When experiment completes (P)

Autobackup — Back up current probe file (M)

Syntax: Autobackup

Description: Makes a copy of the probe file before starting the calibrations and prints the current calibration file. Autobackup is called by the autocalibration routines AuCALch3i1 and AuCALch3oh1

autodept — Automated complete analysis of DEPT data (M)

Syntax: autodept

Description: Processes DEPT spectra, plots the unedited spectra, edits the spectra, plots the edited spectra, and prints outs editing information.

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:

adept	Automatic DEPT analysis and spectrum editing (C)
Dept	Set up parameters for DEPT experiment
deptproc	Process DEPT data (M)
padept	Perform adept analysis and plot resulting spectra (C)
pldept	Plot DEPT data, edited or unedited (M)

autodir — Automation directory absolute path (P)

Applicability: Systems with an automatic sample changer or LC-NMR accessory.

Description: When using a sample changer, autodir is a global variable that holds the absolute path of the currently active automation directory. When VnmrJ is started, autodir is set to the absolute path of the last automation run.

When using the LC-NMR accessory, autodir specifies a directory in which experiments using a stored queue are saved.

See also: *NMR Spectroscopy User Guide*

Related:

auto	Set up an automation directory (C)
autoname	Prefix for automation data file (P)
globalauto	Automation directory name (P)
walkup	Walkup automation (M)

autogo — Start automation run (C)

Applicability: Systems with an automatic sample changer.

Syntax: `autogo<(file<,automation_directory>)>`

Description: Starts an automation run. The autogo parameter cannot be entered while the spectrometer is in automation mode. You must have an enter queue prepared to start an automation run. The queue is checked to verify that it was prepared using the enter command (autogo aborts if an error in the format is found.) Your automation directory is also checked for the presence of a non-empty enter queue (autogo aborts if the current queue in the automation directory is present and not empty). Finally, autogo checks the automation directory and runs the auto command if this directory is not present or another problem is found. When autogo completes, the system is in automation mode and your automation run starts.

Arguments: file is the file name of your enter queue. The default is that the system prompts you for the location of the enter queue.

automation_directory is the pathname of the automation directory. The default is the current value of the parameter autodir.

Examples:

```
autogo
autogo('MySamples')
autogo('MySamples','/home/vnmr1/AutoRun_621')
```

See also: *NMR Spectroscopy User Guide*

Related:

auto	Set up an automation directory (C)
autodir	Automation directory absolute path (P)
autoname	Prefix for automation data file (P)
enter	Enter sample information for automation run (C)

autolist — Set up and start chained acquisition (M)

Syntax: `autolist(<options,>experiment1<,experiment2<,...>)`

Description: Sets up parameters for chained experiments by executing the experiments given as arguments and then starting a chained acquisition. Note that the macro au is executed as part of autolist and should not be included in the arguments to autolist.

Arguments: options is one or more of the following keywords:

- 'auto' is a keyword to add 'wait' to the au call (e.g, au('wait','next')).
- 'start' is a keyword to make the first experiment in the list as one that needs to be acquired rather than processed.

experiment1,experiment2,... are experiments written as strings (e.g., 'dept' or 'c13'). experiment1 is the current experiment and, when it finishes, the macro procplot is called to process the data. If experiment2 is listed, that experiment is executed and then the macro au('next') is performed. For subsequent experiments, the text, solvent and temp are used from the preceding experiment. Also, the wexp parameter is reset to 'autolist' with the first experiment removed.

Examples:
```
autolist('h1','c13','dept')
autolist('h1','hcosy')
```

See also: *NMR Spectroscopy User Guide*

Related:

auto_au	Controlling macro for automation (M)
au	Submit experiment to acquisition and process data (M)
hc	Automated proton and carbon acquisition (M)
hcapt	Automated proton, carbon, and APT acquisition (M)
hccorr	Automated proton, carbon, and HETCOR acquisition (M)
hcosy	Automated proton and COSY acquisition (M)
procplot	Automatically process FIDs (M)
solvent	Lock solvent (P)
temp	Sample temperature (P)
wexp	When experiment completes (P)

autoname — Create path for data storage (C)

Applicability: Automation

Syntax:
```
autoname:$path
autoname(name_template):$path
autoname(name_template,sample_info_file):$path
autoname (name_template,sample_info_file,
<'keepspaces'|'replacespaces'>):$path
autoname(name_template,sample_info_file,
    <,'excluded_suffixes'<,'keepspaces'|'replace
    spaces'>):$path
```

Description: The autoname command determines the path for data storage during an automation run and uses the value of a naming template (the autoname parameter by default) and the contents of a sample info file (default is sampleinfo in the current experiment) to determine this path. The path name is stored in the return argument or displayed on line 3 if no return argument is present.

The name is prefaced with using the value of the parameter autodir or userdir+'/data/' if autodir is equal to ''.

The default excluded_suffix is .fid.

Arguments: No argument provided. The command uses the default autoname parameter and sampleinfo in the current experiment directory for the path to the

sample info file. If the autoname parameter does not exist or is set to '', the default template is%SAMPLE#:%%PEAK#:%.

name_template (no quotes) is string that contains keywords separated by substitution specifiers to represent the data storage path. Substitution specifiers in this template are either a percent sign (%) or a dollar sign ($). The keywords are obtained from the sample_info_file file, if it exists, using % substitution specifiers or VNMR parameters using $ substitution specifiers.

A template is passed directly using:
autoname('$owner$/$sample$'):$path.

Percent sign (%) substitution specifier is used with the autoname command to scan the sample_info_file for the text specific by keyword between the first percent sign in the template string and the next percent sign. The text specified by the keyword between the % substitution specifiers is passed to $path.

The following percent substitutions (% keywords) for time and date are obtained from the system clock, not from the sample info file:

Keyword	*Format*	*Description*
%DATE%	YYYYMMDD	4 digit year 2 digit month 2 digit day
%TIME%	HHMMSS	2 digit each for hours, minutes, and seconds
%YR%	YYYY	4-digit year
%YR2%	YY	2-digit year
%MO%	MM	2-digit month
%DAY%	DD	2-digit day
%HR%	HH	2-digit hour
%MIN%	MM	2-digit month
%SEC%	SS	2-digit second

The following are some of the percent substitutions (% keywords) are obtained from the second argument, sample_info_file.

Keyword	*Description*
%USER%	user name
%MACRO%	macro name
%SAMPLE%	sample name
%SOLVENT%	solvent name

String parameters cannot not contain any of the following characters: ' ', '!', '"', '$', '&', '\', '', '(', ')', '*', ';', '<', '>', '?', '\\', '[', ']', '^', '`', '{', '}', '|', ',', '\0'

Version number is specified by %Rn% where n is an integer from 0 to 9 (default 2), as follows:

n=	*Description*
0	no revision digits are appended (all names must be uniquely constructed without these revision digits).
1 to 9	revision number is padded with leading zeroes to form an n-digit number. If more places are needed than specified, more zeroes are used.

>9 (more than one digit)	Rnn is still used as a search string in the sampleinfo file. %Rn% must be specified at the end of the name_template string. The revision digits are always appended except if %R0% is used.
no %Rn%	default of %R2% is used

Specify the starting number to be used when constructing the version number by appending a colon **:** and start number after Rn.

The default starting value is 1. A zero is not allowed.

Dollar sign ($) substitution specifiers works in manner analogous to the percent substitution specifier, except that the text between the dollar signs is interpreted as the name of a VNMR parameter. The value of this parameter is substituted for the substitution specifier.

Numeric parameters are represented as a string and truncated to an integer value. The template, pw=pwusec, with vnmr parameter pw having a value of 12.3 produces pw=12usec01 which is appended to .fid and passed to $path. The 01 following usec is added by the %R2% default setting.

sample_info_file (no quotes) is the name of a text file to read for the % substitutions passed to autoname. The file must exist.

Using the keyword 'replacespaces' uses underscores (_) in place of spaces ' ' in the resulting path name or the keyword 'keepspaces' retains spaces in the resulting path name.

The keyword, 'keepspaces' or 'replacespaces' is an optional argument (includes quotes). The argument is accepted as the third or fourth argument.

Solaris and Linux operating systems default to replacespaces.

A comma separated list of excluded suffixes the new path name will not use or match is specified if the third keyword is not 'keepspaces' or 'replacespaces'.

Examples: Using a $ substitution specifier:

```
autoname(pw=$pw$usec):$path
```

A $ substitution specifier, pw=pwusec, is the name_template and a relative path. The vnmr parameter, pw, has a value of 12.3 and the resulting filename is: pw=12usec01.fid. The path name is prefaced with the value of the parameter autodir if the name template generates a relative pathname.

Examples: Using $ substitution specifiers and a comma separated list of suffixes:

```
autoname('$seqfil$_$tn$_','/vnmr/
conpar','.img'):$path
```

The $ substitution specifier is; $seqfil$_tn_ the dummy info filename is; '/vnmr/conpar', and the comma separated list of excluded suffixes is .img. The path name is prefaced with seqfil_tn_index. Each time a file is written to the directory the command changes the index by one (see %Rn% above). The suffix is both .fid and .img. The file is named gems_H1_03.img if target directory contains gems_H1_01.fid and gems_H1_02.img.

See also: *NMR Spectroscopy User Guide*, *VnmrJ User Programming*, *VnmrJ Walkup*

Related:		
	autoname	Temple determining the path where is data stored (P)
	Svfname	Determines the name used to store data (C)
	svfname	Specifies the filename template (P)

autoname — Prefix for automation data file (P)

Applicability: Automation

Description: The autoname temple determines the resulting path where the data is stored for an entry in the automation run and uses the contents of a sample info file (the name by default is "sampleinfo" in the current experiment) to determine this path. The path name is stored in the return argument and displayed on line 3 if no return argument is present.

See also: *NMR Spectroscopy User Guide, VnmrJ User Programming, VnmrJ Walkup*

Related: autoname Determines path for data storage during an automation run (C).

autora — Resume suspended automation run (C)

Applicability: Systems with an automatic sample changer.

Syntax: autora

Description: Resumes a previously suspended automation run. No matter what caused the interruption (including autosa, power failure, or system boot-up), the system examines the condition of the automation file and resumes acquisition for all experiments that have not finished. If autora is executed while an automation run is in progress, it has no effect.

See also: *NMR Spectroscopy User Guide*

Related: autosa Suspend current automation run (C)

autosa — Suspend current automation run (C)

Applicability: Systems with an automatic sample changer.

Syntax: autosa

Description: Suspends the automation mode at the conclusion of the current experiment and changes the system to the manual mode. The currently running experiment is not interrupted.

See also: *NMR Spectroscopy User Guide*

Related: autora Resume suspended automation run (C)

autoscale — Resume autoscaling after limits set by scalelimits macro (M)

Syntax: autoscale

Description: Returns to autoscaling in which the scale limits are determined by the expl command such that all the data in the expl input file is displayed.

See also: *NMR Spectroscopy User Guide*

Related: expl Display exponential or polynomial curves (C)
scalelimits Set limits for scales in regression (M)

autostack — Automatic stacking for processing and plotting arrays (M)

Syntax: autostack

Description: When processing and plotting arrayed 1D spectra, VnmrJ automatically determines whether the stacking mode is horizontal, vertical or diagonal from the number of traces and the number of lines in the spectrum. If this automatic function is not desirable (or makes an undesirable decision), it can be overridden by placing the stack macro in the experiment startup macro or by calling stack before processing (or reprocessing) a spectrum. autostack switches back to automatic determination of the stack mode by destroying the stackmode parameter.

See also: *NMR Spectroscopy User Guide*

Related:

procarray	Process arrayed 1D spectra (M)
plarray	Plot arrayed 1D spectra (M)
stack	Fix stacking mode for processing / plotting arrayed spectra (M)
stackmode	Stacking control for processing (P)

autotest — Open Auto Test Window (C)

Syntax: `autotest`

Description: Opens the Auto Test window.

See also: *AutoTest Software* manual.

autotime — Displays approximate time for automation (M)

Syntax: `autotime(<automation directory>)`

Description: Displays approximate time for each experiment and for each location in an automation run. If no argument is given, time is calculated for the current automation run (`enterQ`).

See also: *NMR Spectroscopy User Guide*

Related:

explist	Display approximate time for current experiment chain (M)

av — Set abs. value mode in directly detected dimension (C)

Syntax: `av`

Description: Selects the absolute-value spectra display mode by setting the parameter dmg to the string value `'av'`. In the *absolute-value display mode*, each real point in the displayed spectrum is calculated as the square root of the sum of the squares of the real and imaginary points comprising each respective complex data point. All information, including noise, is always positive, and the relationship between signal and noise is linear.

For multidimensional data, `av` has no effect on data prior to the second Fourier transform. If `pmode='full'`, `av` acts in concert with commands ph1, av1, or pwr1 to yield the resultant contour display for the 2D data.

See also: *NMR Spectroscopy User Guide*

Related:

av1	Set abs. value mode in 1st indirectly detected dimension (C)
av2	Set abs. value mode in 2nd indirectly detected dimension (C)
dmg	Display mode in directly detected dimension (C)
dmgf	Absolute-value display of FID data or spectrum in `acqi` (P)
ft	Fourier transform 1D data (C)
ft1d	Fourier transform along f_2 dimension (C)
ft2d	Fourier transform 2D data (C)
pa	Set phase angle mode in directly detected dimension (C)
pa1	Set phase angle mode in 1st indirectly detected dimension (C)
ph	Set phased mode in directly detected dimension (C)
ph1	Set phased mode in 1st indirectly detected dimension (C)
pmode	Processing mode for 2D data (P)
pwr1	Set power mode in 1st indirectly detected dimension (C)
wft	Weigh and Fourier transform 1D data (C)
wft1d	Weigh and Fourier transform of 2D data (C)
wft2d	Weigh and Fourier transform 2D data (C)

av1 — Set abs. value mode in 1st indirectly detected dimension (C)

Syntax: `av1`

Description: Selects the absolute-value spectra display mode along the first indirectly detected dimension by setting the parameter `dmg1` to the value `'av1'`. If the parameter `dmg1` does not exist, `av1` creates it and set it to `'av1'`.

In the *absolute-value display mode*, each real point in the displayed trace is calculated as the square root of the sum of the squares of the real and imaginary points comprising each respective complex data point. For hypercomplex data, the real-real and imaginary-real points from each respective hypercomplex data point are used in the summation. In this mode, all information, including noise, is always positive; and the relationship between signal and noise is linear.

The `av1` command is only needed if mixed-mode display is desired. If the parameter `dmg1` does not exist or is set to the null string, the display mode along the first indirectly detected dimension defaults to the display mode of the directly detected dimension (characterized by the parameter `dmg`). For the contour display of multidimensional data, the result of `av1` is the same as for traces provided that `pmode='partial'` or `pmode=''` (two single quotes with no space between).

See also: *NMR Spectroscopy User Guide*

Related:

`av`	Set abs. value mode in directly detected dimension (C)
`dmg1`	Data display mode in 1st indirectly detected dimension (P)

av2 — Set abs. value mode in 2nd indirectly detected dimension (C)

Syntax: `av2`

Description: Selects absolute-value spectra display mode for the second indirectly detected dimension by setting the parameter `dmg2` to the value `'av2'`. If `dmg2` does not exist or is set to the null string, `av2` creates `dmg2` and set it equal to `'av2'`.

In the *absolute-value display mode*, all information, including noise, is positive; and the relationship between signal and noise is linear. Each real point in the displayed trace is calculated as the square root of the sum of the squares of the real and imaginary points comprising each respective complex data point. For hypercomplex data, the real-real and imaginary-real points from each respective hypercomplex data point are used in the summation.

The `av2` command is only needed if mixed-mode display is desired. If the parameter `dmg2` does not exist or is set to the null string, the display mode along the second indirectly detected dimension defaults to the display mode of the directly detected dimension (characterized by the parameter `dmg`). For the contour display of multidimensional data, the result of `av2` is the same as for traces provided that `pmode='partial'` or `pmode=''` (two single quotes with no space between).

See also: *NMR Spectroscopy User Guide*

Related:

`av`	Set abs. value mode in directly detected dimension (C)
`dmg2`	Data display mode in 2nd indirectly detected dimension (P)

averag — Calculate average and standard deviation of input (C)

Syntax:
```
averag(number1,number2,...):average,sd,
    number_arguments,sum_numbers,sum_squares
```

Description: Finds average, standard deviation, and other characteristics of a set of numbers.

Arguments: `number1,number2,...` is a finite set of numbers.

`average` is the average of the numbers.

`sd` is the standard deviation of the numbers.

number_arguments is the number of number1,number2,... arguments.

sum_numbers is the sum of the numbers

sum_squares is the sum of squares of the numbers.

Examples: averag(3.4,4.3,3.5,5.4):r1,r2

See also: *VnmrJ User Programming*

awc — Additive weighting const. in directly detected dimension (P)

Description: Adds the current value of awc to each value of the weighting function along the directly detected dimension. This dimension is often referred to as the f_2 dimension in 2D data sets, the f_3 dimension in 3D data sets, and so forth. awc is applied *after* the sinebell and exponential function, but *before* the Gaussian function. This allows using gf as a Gaussian apodization even when awc is non-zero. Typical value of awc is *'n'*.

See also: *NMR Spectroscopy User Guide*

Related:

awc1	Additive weighting const. in 1st indirectly detected dimension (P)
awc2	Additive weighting const. in 2nd indirectly detected dim. (P)
gf	Gaussian function in directly detected dimension (P)

awc1 — Additive weighting const. in 1st indirectly detected dimension (P)

Description: Adds the current value of awc1 to each value of the weighting function along the first indirectly detected dimension This dimension is often referred to as the f_1 dimension of a multidimensional data set. awc1 is analogous to the parameter awc. The “conventional” parameters (lb, gf, etc.) operate on the detected FIDs, while this “2D” parameter is used during processing of the interferograms.

See also: *NMR Spectroscopy User Guide*

Related:

awc	Additive weighting const. in directly detected dimension (P)

awc2 — Additive weighting const. in 2nd indirectly detected dimension (P)

Description: Adds the current value of awc2 to each value of the weighting function along the second indirectly detected dimension This dimension is often referred to as the f_2 dimension of a multidimensional data set. awc2 is analogous to the parameter awc. The value of awc2 can be set with wti on the 2D interferogram data.

See also: *NMR Spectroscopy User Guide*

Related:

awc	Additive weighting const. in directly detected dimension (P)
wti	Interactive weighting (C)

axis — Provide axis labels and scaling factors (C)

Syntax:
```
axis('fn'|'fn1'|'fn2')
   <:$axis_label,$freq_scaling,$scaling_factor>
```

Description: Displays or returns values of the axis labels and scaling factors to the calling macro. See the macro rl for an example of using this command.

Arguments: 'fn'|'fn1'|'fn2' is the Fourier number parameter for the axis of interest.

$axis_label is the axis label (e.g., ppm, kHz, cm, or ppm(sc)).

$freq_scaling is the divisor needed to convert from units of Hz to the units defined by the axis parameter with any scaling. axis uses the current value

of the axis parameter for that dimension and also checks for axis scaling using the corresponding scalesw, scalesw1, or scalesw2 parameter.

$scaling_factor is a second scaling factor, determined solely by the scalesw type of parameter. This last scaling factor is independent of the value of the axis parameter.

Examples:
```
axis('fn')
axis('fn1'):$lab,$fr,$scl
```

See also: *VnmrJ User Programming*

Related:

axis	Axis label for displays and plots (P)
rl	Set reference line (M)
scalesw	Scale spectral width in directly detected dimension (P)
scalesw1	Scale spectral width in 1st indirectly detected dimension (P)
scalesw2	Scale spectral width in 2nd indirectly detected dimension (P)

axis — Axis label for displays and plots (P)

Applicability: Certain arguments work only if system has the proper hardware.

Description: Specifies the units for the axis display and plot.

For 1D experiments, axis uses a single letter that includes 'h' for Hz, 'p' for ppm, and 'k' for kHz (e.g., axis='h').

For 2D experiments, axis uses two letters, with the first letter describing the detected spectral axis (f_2), and the second letter describing the indirectly detected axis (f_1). Thus axis='ph' is appropriate for a homonuclear 2D-J experiment, with a referenced ppm scale along the spectral axis and an axis in Hz ('h') along the J-axis. axis='pp' is appropriate for COSY or NOESY experiments.

For 3D experiments, axis uses three letters with the first letter describing the detected spectral axis (f_3), the second letter describing the first indirectly detected axis (f_1), and the third letter specifying the second indirectly detected axis (f_2).

The special letter d is used to reference the indirectly detected axis to the parts per million of the decoupler channel, as appropriate for heteronuclear chemical shift correlation experiments, which would typically have axis='pd'. The letter n is used to suppress the axis display on one or both axes (e.g., axis='nn', axis='pn').

For systems with multiple decouplers, the characters '1', '2', and '3' can be used to reference an axis relative to the frequency of that decoupler. Setting axis='p1' is effectively the same as axis='pd'.

Values:
'1' sets the axis label for units of ppm relative to the first decoupler.
'2' sets the axis label for units of ppm relative to the second decoupler.
'3' sets the axis label for units of ppm relative to the third decoupler.

'c' sets the axis label for units of centimeters.
'd' sets the axis label for units of ppm relative to the first decoupler.
'h' sets the axis label for units of hertz.

'k' sets the axis label for units of kilohertz.
'm' sets the axis label for units of millimeters.
'n' sets no axis label display.

'p' sets the axis label for units of ppm relative to the observe transmitter.
'u' sets the axis label for units of micrometers.

See also: *NMR Spectroscopy User Guide*

Related:

axis	Provide axis labels and scaling factors (C)
axisf	Axis label for FID displays and plots (P)

dscale	Display scale below spectrum or FID (C)
pscale	Plot scale below spectrum or FID (C)

axisf — Axis label for FID displays and plots (P)

Description: Specifies the units for the FID axis display and plot. To create the FID display parameters axisf, dotflag, vpf, vpfi, crf, and deltaf (if the parameter set is older and lacks these parameters), enter addpar('fid').

Values:
- 's' sets the axis label for units of seconds.
- 'm' sets the axis label for units of ms.
- 'u' sets the axis label for units of µs.
- 'n' sets no axis label display.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
axis	Axis label for displays and plots (P)
dscale	Display scale below spectrum or FID (C)
pscale	Plot scale below spectrum or FID (C)

B

bandinfo	Shaped pulse information for calibration (M)
banner	Display message with large characters (C)
bc	1D and 2D baseline correction (C)
beepoff	Turn beeper off (C)
beepon	Turn beeper on (C)
bigendian	Determine system byte order (C)
binom	Set up parameters for BINOM pulse sequence (M)
bioref	Bio-NMR Referencing (P)
bootup	Macro executed automatically (M)
box	Draw a box on a plotter or graphics display (C)
boxes	Draw boxes selected by the mark command (M)
bpa	Plot boxed parameters (M)
br24	Set up parameters for BR24 pulse sequence (M)
bs	Block size (P)

bandinfo — Shaped pulse information for calibration (M)

Applicability: Information only useful on systems capable of shaped pulse generation.

Syntax: `bandinfo<(shape,width<,ref_power>)>:duration,power`

Description: Displays a table containing the duration and the predicted 90° pulse power setting for the pulse shape and bandwidth given by the arguments. No parameter settings are changed. The necessary data is contained in the `shapeinfo` file in the `shapelib` subdirectory.

Arguments: If `bandinfo` is run without arguments, prompts operator for input

`shape` is the name of the shape. The default is system prompts for a name.

`width` is the bandwidth, in Hz, desired for the pulse.

`ref_power` is value of `tpwr` to which `pw90` is set. The default is 55 dB.

`duration` is the duration, in µs, of the pulse.

`power` is the predicted 90° pulse power setting.

Examples:
```
bandinfo
bandinfo('sinc',10):pw,tpwr
```

See also: *User Programming*

Related:

pulseinfo	Shaped pulse information for calibration (M)
pw90	90° pulse width (P)
tpwr	Observe transmitter power level with linear amplifiers (P)

banner — Display message with large characters (C)

Syntax: `banner(message<,color>)`

Description: Displays text as large-size characters on the graphics windows.

Arguments: `message` is the text to be displayed. If the text includes a single quotation mark (`'`), it must be preceded by a backslash (`\'`). Multiline displays are available by

inserting two backslashes (\\) between lines. Any undefined characters are displayed as a "bug" shape.

`color` is the color of text on a color display: `'red'`, `'yellow'`, `'green'`, `'cyan'`, `'blue'`, `'magenta'`, and `'white'`. The default is `'yellow'`.

Examples:
```
banner('banner sample')
banner('Don\'t Touch','blue')
```

See also: *User Programming*

bc — 1D and 2D baseline correction (C)

Description: Makes 1D or 2D baseline correction using a spline or a second to twentieth order polynomial fitting of predefined baseline regions. `bc` defines every other integral (those integrals that disappear when `intmod='partial'`) as baseline and attempts to correct these points to zero.

1D baseline correction

Syntax:
```
bc<(n|'unbc'<,nsubregion<,minpoints<,minregion>>>)>
```

Description: Performs a 1D baseline correction. The nonintegrated parts of the spectrum (i.e., every odd region between integral reset points, or the integral gaps with `intmod='partial'`) are divided into baseline subregions. The number of baseline subregions in each area are adjusted as possible, so that the subregions are more or less equal in size. Finally, the "center of gravity" (midpoint in *x and* average of the *y* values in the region) for each of the subregions is calculated.

Arguments: `n` is an integer from `1` to `20` for the baseline correction step. A polynomial of the `(n-1)`th order is calculated "through" the "baseline points" using the Chebychev least-squares fitting algorithm, and that polynomial function is subtracted from the spectrum. The coefficients of the polynomial are written into the file `cureexp+'/bc.out'`. The default is `1`(a spline fit).

`'unbc'` is a keyword to make `bc` read in the coefficients from the file written by the previous `bc` operation and reverse that operation. This option is only functional for polynomials with two or more coefficients performing baseline correction operations on 1D spectra or individual 2D traces (i.e., baseline corrections cannot be undone with the default spline correction).

`nsubregion` defines the number of subregions (minimum 3, maximum 400). By default, the total number of subregions is 20 (if `fn<2048`), 40 (if `fn=2048` or `fn=4096`), or 80 (if `fn>4096`).

`minpoints` sets the minimum number of data points required in an integral gap for `bc` to regard it as baseline. Use this to exclude small, nonintegrated areas between close signals. The default is `fn/1000` (but at least 3).

`minregion` defines the minimum number of subregions assigned to each baseline area. The default is 1.

Examples:
```
bc
bc(3)
bc('unbc')
```
`bc(1,200,8,2)` gives a spline correction using 200 baseline subregions, a gap of 8 data points between two (even) integral regions is regarded as baseline, and each baseline area is split into at least two subregions.

2D baseline correction

Syntax:
```
bc(trace_direction<,num_coeff><,trace_start>
   <,trace_end>)
```

Description: 2D baseline correction can be performed on three types of 2D data:

- f2 spectra (`trace_direction='f2'`) after the first half of a 2D FT (`wft1da`).
- f2 traces (`trace_direction='f2'`) after a full 2D FT (`wft2da`).
- f1 traces (`trace_direction='f1'`) after a full 2D FT (`wft2da`).

Arguments: `trace_direction` specifies the direction, `'f1'` or `'f2'`, along which the 2D baseline correction is to take place.

`num_coeff` is the number of coefficients, from 1 to 20, used in the fitting procedure. The default value is 1, which gives a spline fit. A value of 2 gives a linear baseline fit ($a + bx$), a value of 3 gives a quadratic fit ($a + bx + cx^2$), etc. The maximum value (20) gives a 19th-order polynomial fit with 20 coefficients.

`trace_start` is the trace number for the spectrum on which the 2D baseline correction is to start. It must lie within the appropriate range or an error results.

`trace_end` is the trace number for the spectrum on which the 2D baseline correction is to end. It must lie within the appropriate range or an error results.

Examples:
```
bc('f1')
bc('f2',3)
bc('f2',3,10,60)
```

See also: *NMR Spectroscopy User Guide*

Related:

`dc`	Calculate spectral drift correction (C)
`fn`	Fourier number in directly detected dimension (P)
`intmod`	Integral display mode (P)
`trace`	Mode for 2D data display (P)
`wft1da`	Weight and Fourier transform phase-sensitive data (M)
`wft2da`	Weight and Fourier transform phase-sensitive data (M)

`beepoff` Turn beeper off (C)

Description: Turns off the beeper sound so that the system does not use sound to warn the user when errors occur. The default is the beeper is turned on.

See also: *User Programming*

Related:

`beepon`	Turn beeper on (C)

`beepon` Turn beeper on (C)

Syntax: `beepon`

Description: Turns on the beeper sound so that the user hears a sound when errors occur. The default is the beeper is turned on.

See also: *User Programming*

Related:

`beepoff`	Turn beeper off (C)

`bigendian` Determine system byte order (C)

Syntax: `bigendian:$type`

Description: The bigendian command determines the system byte order for storing numbers. One architecture is Big Endian, used by Sun computers with the “Sparc” CPU’S. The other architecture is Little Endian, used by most PCs.

Return values to argument `$type`:

1 if it is a “Big Endian” system.

0 if it is a “Little Endian” system.

This command should rarely be used. Its only current use is when imaging .fdf files are created. The .fdf file headers can specify whether the data is stored as big or little endian.

binom — Set up parameters for BINOM pulse sequence (M)

Description: Sets up a binomial water suppression pulse sequence.

See also: *NMR Spectroscopy User Guide*

bioref — Bio-NMR Referencing (P)

Applicability: All

Syntax: `bioref='<y or n>'`

Description: Flag, global or local, for Bio-NMR Referencing. Setting the flag (`bioref='y'`) sets the system to bio-NMR referencing (based on `nuctables/nuctabrefBio`) rather than standard IUPAC / organic chemistry referencing (based on `nuctables/nuctabref`). Bio-NMR referencing uses DSS for nuclei such as ^{13}C and liquid NH_3 for ^{15}N.

Creating `bioref` as a local parameter (`create('bioref','flag')` creates a local flag) permits its use for a specific case. The parameter can be created as a local parameter and saved with a standard parameter set (`stdpar/N15`) to enable bio-NMR referencing for a specific nucleus. The local value of the parameter takes precedence over the global parameter.

`create('bioref','flag','global')` — creates a global flag.
`setenumeral('bioref',2,'y','n','global')` — sets the possible values of a string parameter in a parameter tree.

Examples: `bioref='y'` sets referencing to use `nuctables/nuctabrefBio`

Related:

create	Create new parameter in a parameter tree (C)

bootup — Macro executed automatically (M)

Syntax: `bootup<(foreground)>`

Description: Executed automatically when VnmrJ is started up. The `bootup` macro displays a message, looks for a macro `login` in the user's local `maclib` directory and executes it (if found), starts Acqstat and acqi (`acqi` is not run if system is configured as a workstation), and then starts the menu system. This set of actions can be modified on a per user basis by constructing custom `bootup` or `login` macros in the user's `maclib` directory. A custom `login` macro is preferred because all custom `bootup` macros are overridden whenever a new VnmrJ release is installed.

Arguments: `foreground` is 0 if VnmrJ is being run in the foreground or nonzero if being run in the background. This argument is passed to the `login` macro.

See also: *User Programming*

Related:

acqi	Interactive acquisition display process (C)
Acqstat	Bring up the acquisition status display (U)

box — Draw a box on a plotter or graphics display (C)

Syntax:
```
box(<'keywords',>x1mm,x2mm,y1mm,y2mm
  <,'nolimit'>)<:r1,r2>
```

Description: Draws a box on a plotter or a graphics display.

Arguments: 'keywords' identifies the output device ('graphics'|'plotter'), drawing mode ('xor'|'normal'), and drawing capability ('newovly'|'ovly'|'ovlyC').

- 'graphics'|'plotter' is a keyword for the output device. The default is 'plotter'. The output selected is passed to subsequent pen, move, or draw commands and remains active until a different output is specified.
- 'xor','normal' is a keyword for the drawing mode when using the 'graphics' output device. The default is 'normal'. In the 'xor' mode, if a line is drawn such that one or more points of the line are in common with a previous 'xor' line, the common points are erased. In the normal mode, the common points remain. The mode selected is passed to subsequent pen, move, and draw commands and remains active until a different mode is specified.
- 'newovly', 'ovly' and 'ovlyC' are keywords that specify an interactive drawing capability that is slightly slower than the 'xor' mode but more consistent in color. 'newovly' clears any previous draws, boxes, and writes made with the 'ovly' modes and draws the figure. 'ovly' draws without clearing so that multi-segment figures can be created. 'ovlyC' clears without drawing.

x1mm is the left edge of the box, x2mm is the right edge, y1mm is the bottom, and y2mm is the top. The location of the edges are given in plotter units (mm on most plots) and are scaled in mm for the graphics display. (If units are in Hz or ppm, you can use the hztomm command to convert units.)

'nolimit' allows the box to extend outside the limits determined by the parameters sc, wc, sc2, and wc2.

r1, r2 return the location of the upper left corner of the box.

Examples:
```
box('plotter',20,100,40,150)
box(25,105,45,155,'nolimit'):r1,r2
```

See also: *NMR Spectroscopy User Guide*

Related:

gin	Return current mouse position and button values (C)
hztomm	Convert positions from Hz or ppm to plotter units (C)
sc	Start of chart (P)
sc2	Start of chart in second direction (P)
wc	Width of chart (P)
wc2	Width of chart in second direction (P)
wcmax	Maximum width of chart (P)

boxes — Draw boxes selected by the mark command (M)

Syntax: `boxes<('graphics'|'plotter')>`

Description: Draws boxes on a plotter or a graphics display with the location of the edges given in Hz. The data to make the boxes is stored in the mark2d.out file produced by the mark command. If there is no data in mark2d.out, a box is drawn from the current cursor positions. The boxes command also numbers the boxes above the upper left corner.

Arguments: 'graphics'|'plotter' is a keyword to send output to the graphics display or to the plotter, respectively. The default is 'graphics'.

Examples:
```
boxes
boxes('plotter')
```

See also: *NMR Spectroscopy User Guide*

Related:
- `mark` — Determine intensity of spectrum at a point (C)

bpa — Plot boxed parameters (M)

Syntax: `bpa:$sc2_minimum`

Description: Plots a box around the entire chart (assuming blank paper) and then plots "chemist-style" parameters in boxes along the lower edge of the chart. `bpa` is the same as `ppa`, but with a different layout. Both `ppa` and `bpa` behave somewhat naively if the pulse sequence is more complex, but they were designed primarily for chemists, not for spectroscopists.

Arguments: `sc2_minimum` returns the minimum value for `sc2` to plot a scale properly. To use the command `pir`, `vp` has to be set to a non-zero value.

See also: *NMR Spectroscopy User Guide*

Related:
- `apa` — Plot parameters automatically (M)
- `pap` — Plot out "all" parameters (C)
- `pir` — Plot integral amplitudes below spectrum (C)
- `ppa` — Plot a parameter list in "English" (M)
- `sc2` — Start of chart in second direction (P)
- `vp` — Vertical position of spectrum (P)

br24 — Set up parameters for BR24 pulse sequence (M)

Applicability: Systems with solids hardware.

Description: Converts a FLIPFLOP, MREV8, or S2PUL parameter set into a BR24 solids line-narrowing multiple-pulse sequence.

See also: *User Guide: Solid-State NMR*

Related:
- `cylbr24` — Set up parameters for cycled BR24 pulse sequence (M)
- `flipflop` — Set up parameters for FLIPFLOP pulse sequence (M)
- `mrev8` — Set up parameters for MREV8 pulse sequence (M)
- `s2pul` — Set up standard two-pulse sequence (M)

bs — Block size (P)

Description: Directs the acquisition computer, as data are acquired, to periodically store a block of data on the disk, from where it can be read by the host computer.

CAUTION: **If bs='n', block size storage is disabled and data are stored on disk only at the end of the experiment. If the experiment is aborted prior to termination, data will be lost.**

Values: 1 to 32767 transients, `'n'`

See also: *NMR Spectroscopy User Guide*

Related:
- `wbs` — Specify action when *bs* transients accumulate (C)
- `wbs` — When block size (P)

C

c13	Automated carbon acquisition (M)
c13p	Process 1D carbon spectra (M)
calcdim	Calculate dimension of experiment (C)
calfa	Recalculate alfa so that first-order phase is zero (M)
calibflag	Correct systematic errors in DOSY experiments (P)
calibrate	Start a dialog for autocalibration routines (M)
callacq	Utility macro to call Acq command (M)
capt	Automated carbon and APT acquisition (M)
Carbon	Set up parameters for 13C experiment (M)
cat	Display one or more text files in text window (C)
cattn	Coarse attenuator type (P)
cd	Change working directory (C)
cdc	Cancel drift correction (C)
cdept	Automated carbon and DEPT acquisition (M)
cdump	Prints the current graphics screen (M)
celem	Completed FID elements (P)
center	Set display limits for center of screen (C)
centersw	Move cursor to center of spectrum (M)
centersw1	Move cursor to center of spectrum in 1st indirect dimension (M)
centersw2	Move cursor to center of spectrum in 2nd indirect dimension (M)
cexp	Create an experiment (M)
cf	Current FID (P)
cfpmult	Calculate first-point multiplier for 2D experiments (M)
change	Submit a change sample experiment to acquisition (M)
checkstring	Find and replace unwanted characters (C)
chiliConf	Control flag set by ecc_on and ecc_off (P)
Cigar2j3j	Convert the parameter to a CIGAR2j3j experiment (M)
cla	Clear all line assignments (M)
cla	Calculated transition number (P)
clamp	Calculated transition amplitude (P)
cleanexp	Remove old files and directories from an experiment (M)
clear	Clear a window (C)
cleardosy	Delete temporarily saved data in current sub experiment (M)
clfreq	Calculated transition frequency (P)
clindex	Index of experimental frequency of a transition (P)
clradd	Clear add/subtract experiment (C)
color	Select plotting colors from a graphical interface (M)
combiplate	View a color map for visual analysis of VAST microtiter plate (U)
combishow	Display regions (red, green, and blue) in CombiPlate window (M)
compressfid	Compress double-precision FID data (M,U)
config	Display current configuration and possibly change it (M)
confirm	Confirm message using the mouse (C)
Console	System console type (P)

C

contact_time	MAS cross-polarization spin-lock contact time (M)
continueMovie	Continue movie in either forward or backward direction (C)
convert	Convert data set from a VXR-style system (M,U)
convertbru	Convert Bruker data (M,U)
copy	Copy a file (C)
cos	Find cosine value of an angle (C)
Cosy	Convert the parameter to a COSY experiment (M)
cosyps	Set up parameters for phase-sensitive COSY pulse sequence (M)
cp	Copy a file (C)
cp	Cycle phase (P)
cpmgt2	Set up parameters for CPMGT2 pulse sequence (M)
cpos_cvt	Convert data set from a VXR-style system (M,U)
cptmp	Copy experiment data into experiment subfile (M)
cpx	Create pbox shape file (M)
cqexp	Load experiment from protocol (M)
cqfindz0	Run an experiment to find the value of z0 (M)
cqgmap	Perform gradient shimming utility functions (M)
cqinit	Initialize liquids study queue (M)
cqpars	Create study queue parameters for liquids (M)
cqplot	Macro to perform generic 2D plot (M)
cqprotocol	Macro to create protocols (M)
cqreset	Reset study queue parameters (M)
cqsavestudy	Macro to save study queue parameters (M
cqwtmenu	Macro to set weighting functions from a panel (M)
cr	Cursor position in directly detected dimension (P)
cr1	Cursor position in 1st indirectly detected dimension (P)
cr2	Cursor position in 2nd indirectly detected dimension (P)
crcom	Create user macro without using text editor (M)
create	Create new parameter in a parameter tree (C)
createqcomp	Create qcomp parameter (M)
crf	Current time-domain cursor position (P)
crl	Clear reference line in directly detected dimension (M)
crl1	Clear reference line in 1st indirectly detected dimension (M)
crl2	Clear reference line in 2nd indirectly detected dimension (M)
crmode	Current state of the cursors in df, ds, or dconi programs (P)
crof2	Recalculate rof2 so that lp = 0 (M)
cryo_noisetest	Run Cold Probe conditioning experiments (M)
cryoclient	Start the CryoBay Monitor program (M, U)
ct	Completed transients (P)
ctext	Clear the text of the current experiment (C)
curexp	Current experiment directory (P)
curscan	Scan currently in progress (P)
curwin	Current window (P)
cutoff	Data truncation limit (P)
cyclenoe	Set up parameters for CYCLENOE pulse sequence (M)
cylbr24	Set up parameters for cycled BR24 pulse sequence (M)

cylmrev	Set up parameters for cycled MREV8 pulse sequence (M)
cz	Clear integral reset points (C)

c13 — Automated carbon acquisition (M)

Syntax: `c13<(solvent)>`

Description: Prepares parameters for automatically acquiring a standard ^{13}C spectrum. The parameter `wexp` is set to `'procplot'` for standard processing. If `c13` is used as the command for automation via the `enter` command, the `au` is supplied automatically and should not be entered on the MACRO line of the `enter` program. However, it is possible to customize the standard `c13` macro on the MACRO line by following it with additional commands and parameters. For example, `c13 nt=1` uses the standard `c13` setup but with only one transient.

Arguments: `solvent` is the name of the solvent. In automation mode the solvent is supplied by the `enter` program. The default is `'CDCl3'`.

Examples:
```
c13
c13('DMSO')
```

See also: *NMR Spectroscopy User Guide*

Related:

`au`	Submit experiment to acquisition and process data (M)
`c13p`	Process of 1D carbon spectra (M)
`enter`	Enter sample information for automation run (C)
`proc1d`	Processing macro for simple (non-arrayed) 1D spectra (M)
`procplot`	Automatically process FIDs (M)
`wexp`	When experiment completes (P)

c13p — Process 1D carbon spectra (M)

Syntax: `c13p`

Description: Processes non-arrayed 1D carbon spectra using a set of standard macros. `c13p` is called by the `proc1d` macro, but can also be used directly. Fully automatic processing (up to a point where a spectrum could be plotted) is provided: Fourier transformation (using pre-set weighting functions), automatic phasing (`aphx` macro), automatic integration (`integrate` macro if required only), vertical scale adjustment (`vsadjc` macro), avoiding excessive noise (`noislm` macro), threshold adjustment (`thadj` macro), and referencing to the TMS signal if present (`setref` macro then `tmsref` macro).

See also: *NMR Spectroscopy User Guide*

Related:

`aphx`	Perform optimized automatic phasing (M)
`c13`	Automated carbon acquisition (M)
`integrate`	Automatically integrate 1D spectrum (M)
`noislm`	Limit noise in spectrum (M)
`proc1d`	Processing macro for simple (non-arrayed) 1D spectra (M)
`setref`	Set frequency referencing for proton spectra (M)
`thadj`	Adjust threshold (M)
`tmsref`	Reference spectrum to TMS line (M)
`vsadjc`	Adjust vertical scale for carbon spectra (M)

calcdim — Calculate dimension of experiment (C)

Syntax: `calcdim`

Description: Calculates the dimension of an experiment and puts the result into the parameter arraydim. If an experiment is arrayed, arraydim is the product of the size of the arrays.

See also: *NMR Spectroscopy User Guide*

Related:

arraydim	Dimension of experiment (P)

calfa — Recalculate alfa so that first-order phase is zero (M)

Syntax: calfa

Description: Based upon the current alfa and lp values, calfa calculates a new value for alfa so that the first-order phase parameter lp is rendered approximately 0. When digital filtering is active (dsp='r' or dsp='i'), calfa also adjusts rof2 as well as alfa. For calfa to work properly, a trial spectrum must be obtained and phased to pure absorption. This spectrum provides calfa with the current alfa and lp values. calfa pertains to processing 2D data. Unless lp is approximately 0, fpmult will affect both the dc offset and the curvature of the spectrum.

See also: *NMR Spectroscopy User Guide*

Related:

alfa	Set alfa delay before acquisition (P)
cfpmult	Calculate first-point multiplier for 2D experiments (M)
crof2	Recalculate rof2 so that lp = 0 (M)
dc	Calculate spectral drift correction (C)
dsp	Type of DSP for data acquisition (P)
fpmult	First-point multiplier for np FID data (P)
hoult	Set parameters alfa and rof2 according to Hoult (M)
lp	First-order phase in directly detected dimension (P)
rof2	Receiver gating time following pulse (P)

calibflag — Correct systematic errors in DOSY experiments (P)

Syntax: calibflag

Description: Corrects systematic errors in DOSY experiments.

Values: 'y' corrects systematic deviations in DOSY analysis.

'n' omits gradient correction in DOSY analysis.

See also: *NMR Spectroscopy User Guide*

Related:

dosy	Process DOSY experiments (M)

calibrate — Start a dialog for autocalibration routines (M)

Syntax: calibrate

Description: Starts a dialog for autocalibration routines.

callacq — Utility macro to call Acq command (M)

Syntax: callacq(arg_string)

Description: Utility macro to construct a string to pass to psg via the Acq() command.This macro should be used only by users with advanced knowledge. A well-constructed argument string is required. The motivation for this macro is to make the 'go' macro re-entrant, while still synchronizing with VnmrJ.

Arguments: arg_string is a character string constructed from a macro.

Examples: callacq($callback)

Related:		
	go	Submit experiment to acquisition (M)
	reqparcheck	Flag which enables/disables required parameters (P)
	reqparclear	Clears the parameters in required parameter list (M)
	reqparlist	List of required parameters (P)
	reqpartest	Tests whether required parameters are set (M)

capt — Automated carbon and APT acquisition (M)

Syntax: `capt<(solvent)>`

Description: Prepares parameters for automatically acquiring a standard ^{13}C spectrum, followed by an APT experiment. In non-automation mode, the carbon and APT spectra are acquired in the experiment in which `capt` is entered. Following acquisition completes, the commands `rttmp('C13')` and `rttmp('apt')` can be used for further processing of the carbon and APT spectra, respectively.

Arguments: `solvent` is name of the solvent used. In automation mode, the `enter` program supplies name. In non-automation mode, the default is `'cdcl3'`.

Syntax:
```
capt au
capt('dmso')
```

See also: *NMR Spectroscopy User Guide*

Related:		
	Apt	Prepare parameters for APT experiment (M)
	c13	Automated carbon acquisition (M)
	enter	Enter sample information for automation run (C)
	rttmp	Retrieve experiment subfile (M)

Carbon — Set up parameters for 13C experiment (M)

Description: Set up parameters for ^{13}C experiment

cat — Display one or more text files in text window (C)

Syntax: `cat(file1<,file2,...>)`

Description: Displays the contents of one or more text files on the text window. It pauses after the window has filled and waits for the user to indicate whether it should display more or should terminate.

Arguments: `file1,file2,...` are the names of the files to be displayed.

Examples:
```
cat('/vnmr/manual/cat')
cat('/vnmr/manual/cat','/vnmr/manual/cattn')
```

See also: *NMR Spectroscopy User Guide*

cattn — Coarse attenuator type (P)

Applicability: Systems with a coarse attenuator.

Description: Identifies the type of coarse attenuator if this attenuator is present on the current rf channel. The value of `cattn` is set in the Spectrometer Configuration window (opened by entering `config`) using the label Coarse Attenuator.

Values: 0 for no coarse attenuator, as in the case with class C amplifiers (Not Present choice in Spectrometer Configuration window).

79 for standard systems (79 dB choice in Spectrometer Configuration window).

127 for imaging attenuator (63.5 dB SIS choice in Spectrometer Configuration window).

63 for deuterium decoupler channel.

See also: *VnmrJ Installation and Administration*

Related:

config	Display current configuration and possibly change it (M)
fattn	Fine attenuator (P)
tpwr	Observe transmitter power level with linear amplifiers (P)

cd — Change working directory (C)

Syntax: cd<(directory)>

Description: Changes current working directory to another directory.

Arguments: directory is the name of the directory that becomes the new current working directory. The change is made only if the directory name already exists and the user has permission to be in the directory. If no argument is included, cd changes the current working directory to the user's home directory.

Examples:

```
cd
cd(userdir+'/exp1')
cd('/home/george/vnmrsys')
```

See also: *NMR Spectroscopy User Guide*

Related:

pwd	Display current working directory (C)

cdc — Cancel drift correction (C)

Syntax: cdc

Description: Turns off the drift correction started by the dc command and resets the spectral drift correction parameters lvl (level) and tlt (tilt) to zero.

See also: *NMR Spectroscopy User Guide*

Related:

dc	Calculate spectral drift correction (C)
dcg	Drift correction group (P)
lvl	Zero-order baseline correction (P)
tlt	First-order baseline correction (P)

cdept — Automated carbon and DEPT acquisition (M)

Syntax: cdept<(solvent)>

Description: Prepares parameters for automatically acquiring a standard ^{13}C spectrum, followed by a DEPT experiment. In non-automation mode, the carbon and DEPT spectra are acquired in the experiment in which cdept was entered. Following the completion of the acquisition, the rttmp('C13') and rttmp('dept') commands can be used for further processing of the carbon and DEPT spectra, respectively.

Arguments: solvent is name of the solvent used. In automation mode, the enter program supplies name. In non-automation mode, the default is 'cdcl3'.

Examples:

```
cdept au
cdept('DMSO')
```

See also: *NMR Spectroscopy User Guide*

Related:

adept	Automatic DEPT analysis and spectrum editing (C)
c13	Automated carbon acquisition (M)
dept	Prepare parameters for DEPT experiment (M)

enter	Enter sample information for automation run (C)
rttmp	Retrieve experiment subfile (M)

cdump — Prints the current graphics screen (M)

Syntax: `cdump('filename')`

Description: `cdump` takes the current display and sends it to the current printer. If an optional `filename` is passed as an argument, the current display will be saved in the print subdirectory of the user's `vnmrsys` directory. This directory will be created if is does not already exist. If the `filename` passed to the `cdump` macro is an absolute pathname, i.e., it starts with a '/' character, that pathname will be used.

If the current display is saved as a file, the format of the file is specified by the `printformat` parameter. It can be set to the following values. as for PostScript formatted output.

`japed` for Joint Photographic Experts Group JFIF formatted output.
`nag` for Portable Network Graphics formatted output.

celem — Completed FID elements (P)

Description: Indicates the current number of completed FIDs in an experiment. When `go` or `au` is entered, `celem` is set to 0. As each FID acquisition is completed, `celem` is updated to reflect this. This parameter is most useful in conjunction with `wbs`, `wnt`, `wexp`, and `werr` processing commands.

See also: *NMR Spectroscopy User Guide*

Related:

arraydim	Dimension of experiment (P)
au	Submit experiment to acquisition and process data (C)
go	Submit experiment to acquisition (C)
ni	Number of increments in 1st indirectly detected dimension (P)
wbs	Specify action when `bs` transients accumulate (C)
werr	Specify action when error occurs (C)
wexp	Specify action when experiment completes (C)
wnt	Specify action when `nt` transients accumulate (C)

center — Set display limits for center of screen (C)

Description: Sets parameters `sc` and `wc` (horizontal control) and parameters `sc2` and `wc2` (vertical control) to produce a display (and subsequent plot) in the center portion of the screen (and page). For 2D data, space is left for the scales.

See also: *NMR Spectroscopy User Guide*

Related:

full	Set display limits for a full screen (C)
fullt	Set display limits for full screen with room for traces (C)
left	Set display limits for left half of screen (C)
right	Set display limits for right half of screen (C)
sc	Start of chart (P)
sc2	Start of chart in second direction (P)
wc	Width of chart (P)
wc2	Width of chart in second direction (P)

centersw — Move cursor to center of spectrum (M)

Description: Sets cursor position parameter `cr` in the directly detected dimension for the center of the spectrum.

See also: *NMR Spectroscopy User Guide*

Related:
- centersw1 — Move cursor to center of spectrum in 1st indirect dimension (M)
- centersw2 — Move cursor to center of spectrum in 2nd indirect dimension (M)
- cr — Cursor position in directly detected dimension (P)

centersw1 — Move cursor to center of spectrum in 1st indirect dimension (M)

Description: Sets cursor position parameter cr1 in the first indirectly detected dimension to the center of the spectrum.

See also: *NMR Spectroscopy User Guide*

Related:
- centersw — Move cursor to center of spectrum (M)
- cr1 — Cursor position in 1st indirectly detected dimension (P)

centersw2 — Move cursor to center of spectrum in 2nd indirect dimension (M)

Description: Sets cursor position parameter cr2 in the second indirectly detected dimension to the center of the spectrum.

See also: *NMR Spectroscopy User Guide*

Related:
- centersw — Move cursor to center of spectrum (M)
- cr2 — Cursor position in 2nd indirectly detected dimension (P)

cexp — Create an experiment (M)

Syntax: `cexp(<experiment_dir,>experiment_number)`

Description: Creates an experiment as a temporary workspace that can hold a complete 1D, 2D, or 3D data set. Up to 9999 experiments can be created. Experiment 5 is special because it is the add-subtract experiment. cexp creates the appropriate jexpxxx macro so that the newly created experiment can be joined.

Arguments: experiment_dir specifies the path of the directory in which the particular experiment is to be created. If experiment_dir is not entered, the default is the user directory specified by userdir.

experiment_number specifies the number, from 1 to 9999, of the experiment to be created.

Examples:
```
cexp(3)
cexp('/data',2)
```

See also: *NMR Spectroscopy User Guide*

Related:
- delexp — Delete an experiment (C)
- jexp — Join existing experiment (C)
- userdir — User directory (P)

cf — Current FID (P)

Description: Specifies which FID to operate on when working with multi-FID data. All subsequent operations such as Fourier transformation are applied to the selected data block.

When an experiment acquires nf number of data segments through explicit acquisition, cf indicates the cfth FID to use. For example, in the COSY-NOESY experiment with nf=2, cf=1 would select the COSY part of the experiment, and cf=2 would select the NOESY part.

Values: 1 through the value of parameter nf.

See also: *NMR Spectroscopy User Guide*

Related:		
	nf	Number of FIDs (P)

cfpmult — Calculate first-point multiplier for 2D experiments (M)

Description: Calculates an fpmult value for the dataset, which is then used by wft2da. For 2D experiments, such as NOESY, run cfpmult on the transformed first increment, prior to entering wft2da, to minimize "f_2 ridges" in the final 2D spectrum. To do this manually for a 2D dataset, enter fpmult=1.0 wft(1) cdc in the command line and note whether the spectrum (essentially the baseline) moves up or down when dc is typed. Vary the value of fpmult until the dc correction (jump in the baseline) is as small as possible. With care, fpmult can be set to two decimal places. Typical values for fpmult range from 1.00 to 2.00. The default value is 1.0.

This calculation only needs to be performed for cosine-type experiments, such as NOESY, where both the t_2 FID and the t_1 interferogram decay. cfpmult might give incorrect values for first increments of experiments having baseline distortions (e.g., water suppression with 11-echo or 1331); in such cases, manual optimization of fpmult is more suitable.

When processing 2D data, unless the parameter lp is approximately 0, fpmult affects both the dc offset and the curvature of the spectrum. See the entries for alfa and calfa for more information.

See also: *NMR Spectroscopy User Guide*

Related:		
	alfa	Set alfa delay before acquisition (P)
	calfa	Recalculate alfa so that first-order phase is zero (M)
	crof2	Recalculate rof2 so that lp = 0 (M)
	dc	Calculate spectral drift correction (C)
	fpmult	First point multiplier for np FID data (P)
	lp	First-order phase in directly detected dimension (P)
	wft2da	Weight and Fourier transform phase-sensitive data (M)

change — Submit a change sample experiment to acquisition (M)

Applicability: Systems with automatic sample changer.

Description: Removes the sample currently in the probe and loads the sample currently in sample location loc. change runs in the acquisition computer and is inoperative if loc is 0 and/or traymax is 'n' or 0. change also sets all hardware according to the current parameters.

See also: *NMR Spectroscopy User Guide*

Related:		
	au	Submit experiment to acquisition and process data (C)
	ga	Submit experiment to acquisition and FT the result (C)
	go	Submit experiment to acquisition (C)
	loc	Location of sample in tray (P)
	lock	Submit an autolock experiment to acquisition (C)
	sample	Submit change sample, Autoshim experiment to acquisition (M)
	shim	Submit an Autoshim experiment to acquisition (C)
	spin	Submit a spin setup experiment to acquisition (C)
	su	Submit a setup experiment to acquisition (M)
	traymax	Sample changer tray size (P)

checkstring — Find and replace unwanted characters (C)

Syntax: checkstring('$VALUE',variable):variable

Description: checkstring is used panel to check and replace user-entered strings like samplename, notebook, or page for Unix-unfriendly characters:

" " (blank space) , ; : * ! ? (" ") [" "] {" "} <" "> ~ # $ & /

Data may be saved to unexpected directories (or not at all) with Save Data Setup (used for automatic saving of NMR data) if operating system special characters are used within a filename.

An error/warning message is issued and the respective character(s) is/are replaced with an underscore, _. Multiple consecutive characters are replaced by one single underscore. Example: samplename = 'special type of (new) sample' becomes 'special_type_of_new_sample'.

chiliConf — Control flag set by ecc_on and ecc_off (P)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Control flag set by ecc_on and ecc_off macros

Values: E — enable PSG control of ECC
n — disable PSG control of ECC

Related:		
	ecc_on	Turns on eddy current compensation for Cold Probes (M)
	ecc_off	Turns off eddy current compensation for Cold Probes (M)

Cigar2j3j — Convert the parameter to a CIGAR2j3j experiment (M)

Syntax: Convert the parameter to a CIGAR2j3j experiment.

cla — Clear all line assignments (M)

Syntax: cla

Description: Clears the line assignment parameters clindex and slfreq for spin simulation iteration, which matches simulated spectra to actual data.

See also: *NMR Spectroscopy User Guide*

Related:		
	assign	Assign transitions to experimental lines (M)
	dla	Display line assignments (M)
	clindex	Index of experimental frequency of a transition (P)
	slfreq	Measured line frequencies (P)

cla — Calculated transition number (P)

Description: A global arrayed parameter that stores the transition number of calculated transitions of the spin simulation program when they are above a threshold set by sth. In the iterative mode, the cla value of an assigned transition is associated with an experimental frequency whose index is the clindex value.

See also: *NMR Spectroscopy User Guide*

Related:		
	clamp	Calculated transition amplitude (P)
	clfreq	Calculated transition frequency (P)
	clindex	Index of experimental frequency of a transition (P)
	sth	Minimum intensity threshold (P)

clamp — Calculated transition amplitude (P)

Description: A global arrayed parameter that stores the transition amplitude of calculated transitions of the spin simulation program when they are above a threshold set by the parameter sth. Enter dla('long') to display clamp.

See also: *NMR Spectroscopy User Guide*

Related:

cla	Calculated transition number (P)
clfreq	Calculated transition frequency (P)
clindex	Index of experimental frequency of a transition (P)
dla	Display line assignments (C)
sth	Minimum intensity threshold (P)

cleanexp — Remove old files and directories from an experiment (M)

Syntax: cleanexp<(file1<,file2<,...>>)>

Description: Removes experiment subfiles from chained experiments that exist in an experiment directory. cleanexp only cleans the currently active experiment.

Arguments: file1, file2, ... are specific experiment subfiles to be removed. If no argument is given, all files in curexp/subexp are removed.

Examples:
```
cleanexp
cleanexp('H1','relayh')
```

See also: *NMR Spectroscopy User Guide*

Related:

curexp	Current experiment directory (P)
hccorr	Automated proton, carbon, and HETCOR acquisition (M)
hcosy	Automated proton and COSY acquisition (M)

clear — Clear a window (C)

Syntax: clear<(window_number)>

Description: Clears one of the four windows on the GraphOn terminal (status, input, graphics, text) or one of the two windows on the Sun (text and graphics).

Arguments: window_number is the number (1 to 4) of the window to be cleared:

- 1 clears the status window (GraphOn only)
- 2 clears the graphics window
- 3 clears the input window (GraphOn only)
- 4 clears the text window (the default value).

Examples:
```
clear
clear(2)
```

See also: *User Programming*

cleardosy — Delete temporarily saved data in current sub experiment (M)

Syntax: cleardosy

Description: Deletes any copies of DOSY data temporarily saved in the current sub experiment.

See also: *NMR Spectroscopy User Guide*

Related:

dosy	Process DOSY experiments (M)

C

clfreq **Calculated transition frequency (P)**

Description: A global arrayed parameter that stores the transition frequency of calculated transitions of the spin simulation program when they are above a threshold set by the parameter sth. Enter dla to display clfreq.

See also: *NMR Spectroscopy User Guide*

Related:

cla	Calculated transition number (P)
clamp	Calculated transition amplitude (P)
clindex	Index of experimental frequency of a transition (P)
dla	Display line assignments (M)
sth	Minimum intensity threshold (P)

clindex **Index of experimental frequency of a transition (P)**

Description: A global arrayed parameter where each value contains the index of an experimental frequency assigned to the associated calculated transition for use in iterative spin simulation. Use assign to make the assignments. A value of zero indicates no assignment.

See also: *NMR Spectroscopy User Guide*

Related:

assign	Assign transitions to experimental lines (M)
cla	Clear line assignments (M)
cla	Calculated transition number (P)
dla	Display line assignments (M)

clradd **Clear add/subtract experiment (C)**

Description: Deletes the add/subtract experiment (exp5).

See also: *NMR Spectroscopy User Guide*

Related:

add	Add current FID to add/subtract experiment (C)
sub	Subtract current FID from add/subtract experiment (C)

color **Select plotting colors from a graphical interface (M)**

Description: Displays a window with color palettes for selecting colors for plotting the background of the display screen, spectrum, integral, FID, etc.

See also: *NMR Spectroscopy User Guide*

Related:

pl	Plot spectra (C)
setcolor	Set colors for graphics window and for plotters (C)

combiplate **View a color map for visual analysis of VAST microtiter plate (U)**

Syntax: (From UNIX) combiplate

Description: Opens the CombiPlate window, which provides a map of microtiter plate, allowing data to be viewed from individual sample wells. The window enables viewing integral region intensities by colors and color densities.

See also: *NMR Spectroscopy User Guide*

Related:

combishow	Display regions as red, green, and blue in CombiPlate window (M)
dlivast	Produce text file and process last wells (M)

combishow **Display regions (red, green, and blue) in CombiPlate window (M)**

Syntax: combishow(r,g,b)

Description: Displays integral regions shown on the spectrum as red (`r`), green (`g`), and blue (`b`) in the CombiPlate window. CombiPlate reads the regions automatically. 1, 2, or 3 integral regions can be designated. At least one integral region must be specified. Combishow displays spectra associated with individual wells.

See also: *NMR Spectroscopy User Guide*

Related:
- `combiplate` View a color map for visual analysis of VAST microtiter plate (U)
- `dlivast` Produce text file and process last wells (M)

`compressfid` Compress double-precision FID data (M,U)

Syntax: `compressfid(<inFIDdir,>outFIDdir)`
(From UNIX) `compressfid -i inFIDdir -o outFIDdir -f`
(From UNIX) `compressfid -e exp_number -o outFIDdir -f`

Description: Compresses double-precision FID data to single-precision and updates the parameter `dp` in the file `procpar`. `compressfid` can be run through a macro interface in VnmrJ or directly at the UNIX level. In entering FID directory names, leave off the `.fid` directory extension.

Arguments: `inFIDdir` is the double-precision FID directory to be compressed. If `inFIDdir` is not entered, the default FID directory is `curexp/acqfil`.

`outFIDdir` is the FID directory to receive the output.

`exp_number` is the number of the experiment that contains the FID data.

`-i` specifies that the next argument is the input FID directory.

`-o` specifies that the next argument is the output FID directory.

`-e` specifies that the next argument is the number of the experiment that contains the FID data. The `-e` and the `-i` options are mutually exclusive.

`-f` specifies that any existing directory with the name `outFIDdir.fid` is to be overwritten. Note that the macro interface always overwrites any preexisting directory with the name specified by `outFIDdir.fid`.

Examples:
```
compressfid('/vnmr/fidlib/fid1d',
   'testfid1d')compressfid('testfid1d')
(From UNIX) compressfid -e 5 -o testfid1d -f
(From UNIX) compressfid -i /vnmr/fidlib/fid1d -o
   testfid1d -f
```

See also: *NMR Spectroscopy User Guide*

Related:
- `dp` Double precision (P)

`config` Display current configuration and possibly change it (M)

Syntax: `config <('display')>`

Description: Displays the current system configuration parameters in a window (called the Spectrometer Configuration window). The values of the configuration parameters can be changed if `config` is entered from the console without any arguments and the user has write access to the directories `/vnmr` and `/vnmr/conpar`. If so, the user can interactively make changes to the choices in the window.

If the user does not meet the conditions above, or if the VnmrJ administrator enters the command `config('display')`, instead of the interactive mode, the user is restricted to the display mode, where system information is listed in the Process tab -> Text page.

If `config` is entered without any arguments, or if Utilities->System Settings is selected, the program checks if the user is logged in as the administrator. If so,

it runs in interactive mode; if not, it runs in display mode. By entering `config('display')`, vnmr1 can run in the display mode instead of interactively.

In the interactive mode, a separate panel displays the options with the current choice appearing to the right. Position the mouse over the choice to be modified, then use the left button to cycle through each choice or use the right button to display a menu of all possible choices.

The Use Console Data button sets parameter values in the Spectrometer Configuration window using information captured during console startup.

This button makes `config` capture from the system all values shown in the Spectrometer Configuration window except Sample Changer, Sample Changer Serial Port, Rotor Synchronization, Frequency Overrange, and Upper Limit of decoupler power. For the Gradients entry, `config` recognizes the Performa I and Performa II modules but not other gradients. For the VT Controller entry, if VT is found, `config` does not change the value set, and if VT is not found, `config` changes the value to Not Present.

The EXIT, and SAVE button writes a new `conpar` configuration file before leaving. The QUIT, no SAVE button terminates the session with no modifications to the `conpar` file, but remember that the parameters are always set. These two buttons require use of the left button on the mouse. In the display mode, the current choices are displayed in the text window.

To send output to the printer, enter the sequence of commands `printon config('display') printoff`.

Commands for working with parameters (such as `create`, `destroy`, `exists` and `setvalue`) have an option to select which parameter tree the parameter is in. The `systemglobal` tree is the internal name for `/vnmr/conpar`, and it can be used to search for, modify, or create a parameter in `conpar`. But note that any changes made, either directly (e.g., by typing `vttype=0`) or by using `create` and similar commands, only affect parameters in memory. To permanently change parameters:

- For parameters in `config`, enter the change in the Spectrometer Configuration window and then quit using the Exit & Save button.
- For other parameters, after creating or changing the parameter, enter `fsave('/vnmr/conpar','systemglobal')`.

Both methods, usually restricted to `vnmr1` only, overwrite `conpar`.

The Spectrometer Configuration labels listed below can be changed in the interactive mode. For each label, the choices available and a short description of the label is provided. Shown in parentheses is the associated parameter, which you should refer to for further information.

- System Type: Spectrometer or Data Station. Sets the basic type of system (`system`).
- Console: or Imager. Sets the type of system console (`Console`). When `go`, `au`, or `ga` is entered, the value set is copied to the current experiment as the `console` parameter (lowercase c).
- Proton Frequency: 085, 100, 200, 300, 400, 500, 600, 700, 750, 800, 900, 3T, and 4T. Sets the resonant frequency, in MHz or tesla, of ^{1}H as determined by magnet field strength (`h1freq`).
- Sample Changer: None, Carousel, SMS 50 Sample, SMS 100 Sample, VAST, NMS, LC-NMR, 768 AS. Sets the type of sample changer. Set to none if a sample changer is not present or is to be disabled (`traymax`).
- Sample Changer Comm Port: Not Used, Port A, Port B, Ethernet. Sets the serial port used to connect the sample changer. Select Not Used if no sample changer is present (`smsport`).

- Shimset: Varian 13 Shims, Varian 14 Shims, Oxford 15 Shims, Oxford 18 Shims, Varian 18 Shims, Varian 20 Shims, Varian 23 Shims, Varian 26 Shims, Varian 28 Shims, Varian 29 Shims, Varian 35 Shims, Varian 40 Shims, Ultra 18 Shims, Ultra 39 Shims, and Whole Body Shims. Sets type of shim sets on system (`shimset`).
- Audio Filter Type: 100 kHz Elliptical, 100 kHz Butterworth 200 kHz Butterworth, 500 kHz Elliptical. If the spectral width (sw) is less than 100 kHz, sets type of audio filters used (`audiofilter`).
- VT Controller: Not Present, Present. Sets whether a variable temperature controller is present or not on the system (`vttype`).
- Maximum DMF: 9900, 32700, 2.0e6. Sets maximum frequency, in Hz, for decoupler modulation (`parmax[11]`).
- Max. Spectral Width: 100 kHz, 200 kHz, 500 kHz, 2 MHz, 5 MHz. Sets maximum spectral width available to a system (`parmax[5]`).
- AP Interface Type: Type 1, Type 2, Type 3, N/A. Sets type of AP bus interface board in the system.
- Fifo Loop Size: 63, 1024, 2048. Sets size of FIFO loop, which depends on the type of controller board in the system.
- Rotor Synchronization: Not Present, Present. Sets whether system supports the solids rotor synchronization module (`rotorsync`).
- Lock Frequency: (frequency entered directly). Sets lock frequency of the system. **To observe NMR signals, the lock frequency value must be set correctly** (`lockfreq`).
- IF Frequency: 10.5 MHz, 20.0 MHz.
- Number of RF Channels: 1, 2, 3, 4, 5. Selects which rf channel is listed in the Configure panel that appears in the lower section of the Spectrometer Configuration window (`numrfch`).
- Gradients: Not Present, Present. Sets whether system has optional gradients for the X, Y, or Z axis. If present, the gradients are listed in the Configure panel in lower section of Spectrometer Configuration window (Gradients is not associated with any parameter).
- Configure: RF Channel 1 (Obs), RF Channel 2 (Dec), RF Channel 3 (Dec2), RF Channel 4 (Dec 3), RF Channel 5 (Dec4), Gradients. Sets which labels appear in the Configure panel in lower section of Spectrometer Configuration window (Configure is not associated with any parameter)
- Type of RF: U+ Direct Synthesis, U+ H1 Only, Direct Synthesis, Broadband, Fixed Frequency, Deuterium Decoupler, SIS Modulator. Sets type of frequency generation on the current rf channel (`rftype` and `rfchtype`).
- Synthesizer: Not Present, PTS 160, PTS 200, PTS 250, PTS, 320, PTS 500, PTS 620, PTS 1000. Sets type of PTS frequency synthesizer on the current rf channel (`ptsval`).
- Latching: Not Present, Present. On systems equipped with a special version of the PTS frequency synthesizer, sets how frequency values are sent on the current rf channel (`latch`).
- Frequency Overrange: Not Present, 10000 Hz, 100000 Hz. On systems equipped with a special version of the PTS frequency synthesizer, sets the presence of a signal phase stability option on the current rf channel (`overrange`).

- Step Size: 0.1 Hz, 0.2 Hz, 1 Hz, 100 Hz. Sets frequency step size on current rf channel. (`parstep[7]`, `parstep[8]`, `parstep[16]`, `parastep[20]`).
- Coarse Attenuator: Not Present, 63 dB, 79 dB, 63.5 dB (SIS). Sets range of coarse attenuator if this attenuator is present on the current rf channel (`cattn`).
- Upper Limit: (number entered directly). Sets upper limit of the coarse attenuator if this attenuator is present on the current rf channel (`parmax[17]`, `parmax[9]`,`parmax[18]`, `parmax[21]`).
- Fine Attenuator: Not Present, Present. Sets whether a fine attenuator is present or not on the current rf channel (`fattn`).
- Waveform Generator: Not Present, Present. Sets whether a waveform generator board is present or not on current rf channel (`rfwg`).
- Type of Amplifier: Class C, Linear Full Band, Linear Low Band, Shared, Linear Broadband. (Shared is fourth channel only.) Sets type of amplifier on the current rf channel (`amptype`).
- X Axis, Y Axis, Z Axis: None, WFG + GCU, Performa I, Performa II/III, Performa II/III+WFG, Performa XYZ, Performa XYZ+WFG, SIS (12 bit), Homospoil. On systems with gradients, sets type of gradient for each axis. The value is set separately for each axis (`gradtype`).
- Gradient Coil. Detects the gradient coil configuration file that defines the current installed gradient coil (`sysgcoil`).

Arguments: `'display'` is a keyword that the system administrator can use to make `config` run in the display mode rather than the interactive mode.

Examples:
```
config
config('display')
```

See also: *VnmrJ Installation and Administration*

Related:

`amptype`	Amplifier type (P)
`audiofilter`	Audio filter type (P)
`cattn`	Coarse attenuator (P)
`Console`	System console type (P)
`fattn`	Fine attenuator (P)
`fifolpsize`	FIFO loop size (P)
`gradtype`	Gradients for X, Y, and Z axes (P)
`h1freq`	Proton frequency of spectrometer (P)
`latch`	Frequency synthesizer latching (P)
`lockfreq`	Lock frequency (P)
`numrfch`	Number of rf channels (P)
`overrange`	Frequency synthesizer overrange (P)
`parmax`	Parameter maximum values (P)
`parmin`	Parameter minimum values (P)
`parstep`	Parameter step size values (P)
`ptsval`	PTS frequency synthesizer value (P)
`rfchtype`	Type of rf channel (P)
`rftype`	Type of rf generation (P)
`rfwg`	RF waveform generator (P)
`rotorsync`	Rotor synchronization (P)
`shimset`	Type of shim set (P)
`sysgcoil`	System gradient coil (P)
`system`	System type (P)
`traymax`	Sample changer tray slots (P)
`vttype`	Variable temperature controller present (P)

confirm — Confirm message using the mouse (C)

Syntax: `confirm(message):response`

Description: Displays a dialog box with the specified message and two buttons: Confirm and Cancel. Clicking on the buttons with the mouse produces a return value.

Arguments: `message` is a single-line muticharacter string to be shown in the dialog box.

`response` is 1 if the user clicks the left button of the mouse on the Confirm button or presses the Return key; `response` is 0 if the user clicks the mouse on the Cancel button.

Examples: `confirm('Are you sure you want pw>100?'):$response`

See also: *User Programming*

Console — System console type (P)

Description: A global parameter that sets the type of system console The value is usually set using the Console label in the Spectrometer Configuration window (opened from `config`).

When `go`, `au`, or `ga` is entered, the value of the `Console` parameter is copied from the systemglobal parameter tree to the current experiment and named as the `console` parameter (lowercase c). If `console` does not exist in an old parameter set, `rt` via `fixpar` creates it and sets it to `''`. Both `console` and `Console` are type acquisition. Macros can use `Console` and `console` to take conditional action based on spectrometer type.

See also: *VnmrJ Installation and Administration*

Related:

`au`	Submit experiment to acquisition and process data (M)
`config`	Display current configuration and possibly change it (M)
`fixpar`	Correct parameter characteristics in experiment (M)
`ga`	Submit experiment to acquisition and FT the results (M)
`rt`	Retrieve FIDs (M)
`go`	Submit experiment to acquisition (M)
`system`	System type (P)

contact_time — MAS cross-polarization spin-lock contact time (M)

Applicability: Systems with solids module.

Description: Processes data obtained using an array of values for a pulse-length parameter. It runs the UNIX program `expfit`, which does an exponential curve fitting that determines the value of *Tch* and *T1rho*. The output is matched to the equation

$$I = [S0 - (S0 - S_inf)*exp(-T/Tch))*exp(-T/T1rho)) + S_inf$$

where *Tch* is the time constant of a spin-locked cross-polarization process, and *T1rho* is relaxation time of ^{13}C polarization in the proton rotating field.

The required input is file `fp.out` from the program `fp` and the values of the arrayed parameter. The output table is file `analyze.list` in the current experiment. The file `analyze.out` is used by the `expl` to display the results.

See also: *User Guide: Solid-State NMR*

Related:

`expfit`	Least-squares fit to polynomial or exponential curve (U)
`expl`	Display polynomial/exponential curves (C)
`fp`	Find peak heights (C)

continueMovie — Continue movie in either forward or backward direction (C)

Syntax: `continueMovie(rate)`

Description: Like `startMovie`, but can continueMovie can play a movie forward or back ward, and, instead of always starting from the beginning, it starts from the beginning if movie has not started yet, or continues from where it was stopped (by `stopMovie`). Movie direction is controlled by parameter `aipMovieSetting[3]=1` or `-1`.

Arguments: `aipMovieRate`, or a number for the rate

See also: `startMovie`, `stopMovie`, `resetMovie`.

`convert` Convert data set from a VXR-style system (M,U)

Syntax:
```
convert(VXR_file)
(From UNIX) cpos_cvt VXR_file
```

Description: Converts data stored on a VXR-style system (VXR, XL, or Gemini) to the format used in software. The macro `convert` loads the data from `VXR_file` into the current experiment and converts it to the new format. The UNIX command `cpos_cvt` writes the converted data in a subdirectory of the current working directory, using the original name of the data set.

Arguments: `VXR_file` is the name of a VXR-style file to be converted to VnmrJ style

See also: *NMR Spectroscopy User Guide*

Related:

`cpos_cvt`	Convert data set from a VXR-style system (C,U)
`decomp`	Decompose a VXR-style directory (C)

`convertbru` Convert Bruker data (M,U)

Syntax:
```
(From UNIX) convertbru file <options>
convertbru(file<,options>)
```

Description: A C-language program for converting 32-bit Bruker AMX data and 24- and 32-bit Bruker AM data into a 32-bit format compatible with the Varian `sread` program. After converting the Bruker data into the new format, the converted data can be read into VnmrJ using `sread` and can then be processed normally. The parameters `proc` and `proc1` are set appropriately by `sread`, so that `wft` or `wft2da` correctly processes the data.

Bruker AM parameters are converted to Varian parameters as shown in the table "AM Parameter Conversion." Bruker parameter names that do not conflict with a Varian parameter name are converted under the original name: `td`, `fw`, `ds`, `o1`, `o2`, `ns`, `te`, `id`, `sfo1`, `sfo2`, and `ro`. Parameters `proc` and `proc1` are set to `'rft'` for all spectra (assuming TPPI data in both dimensions).

AM Parameter Conversion

Bruker	*Varian*	*Bruker*	*Varian*
sweeps completed	`ct`	`sp`	`satdly`
`td`	`np`	`dp`	`dpwr`
`dw`	`dw`	`te`	`temp=te–273`
`fw`	`fb=1.1*sw/2`	`id`	`sw1=1/id`
`ds`	`ss`	`sfo1`	`sfrq=sfo1+o1`
`sw`	`sw`	`sfo2`	`dfrq=sfo2+o2`
experiments done	`ni`	`p#`	`p#`
`o1`	`tof`	`d#`	`d#`
`o2`	`dof`	`s#`	`s#`
`rd` (or `d1` if `rd=0`)	`rd`	`ro`	`spin`
`pw` (or `p0` if `pw=0`)	`pw`	`rg`	`gain`

Bruker	*Varian*	*Bruker*	*Varian*
p1	pw90	date	date
de	de	time	time
ns	nt		

Bruker AMX parameters are converted to Varian parameters as shown in the table “AMX Parameter Conversion.” All Bruker parameters are converted under their original names if the name doesn't conflict with the name of a Varian parameter. Arrayed Bruker parameters like P and D are converted to the names P# and D#, where # is the index into the array.

Because sread is limited to 8-character parameter names, the parameters routwd1# and routwd2# are converted to rtwd1# and rtwd2#.

The parameter proc is set to 'ft' when the Bruker parameter aq_mod is 1, and proc is set to 'rft' when aq_mod is 2. proc1 is always set to rft, assuming TPPI in t1.

If there is a file named info in the directory with the Bruker data, it is read in and put into the text file for the converted data set.

AMX Parameter Conversion

Bruker	*Varian*	*Bruker*	*Varian*
ns (from acqu)	nt	te	temp=te-273
ns (from acqus)	ct	sfo1	sfrq=sfo1
td (from acqus)	np	sfo2	dfrq=sfo2
td (from acqu2s)	ni	o1	tof
sw_h	sw	o2	dof
sw_h	dw=1.0e6/sw	ro	spin
sw_h (from acqu2s)	sw1	rg	gain
fw	fb=1.1*sw/2	date	date
ds	ss	date	time
rd (or d1 if rd=0)	rd	nucleus	tn
de	de	decnuc	dn
pw (or p0 if pw=0)	pw	pulprog	pslabel
p1	pw90	pulprog	seqfil

Arguments: file is the input file name. For AMX data, file should be the name of the directory that contains the acqus, acqu2s, and fid or ser files. For AM data, file should be the name of the file containing the AM data. The file argument is not required to have a .bru extension, but if it does, the .bru extension is removed before creating the output file. Unless the -cfile option is present, the output file will have the same name as the input file, but with a .cv extension, and will be written into the current working directory.

options for AMX and AM data are the following, which can be entered in any order as long as file comes first (options are usually not necessary, but can be used to override the default actions of convertbru):

- -bam or -bamx specifies whether input is AM or AMX data. The default is determined from name of the input file given.
- -cfile specifies that the output file is given the name specified by file and is written with .cv appended to the name

- `-dxxx`, where `xxx` is the decoupler frequency (it must be a value between 10.0 and 640.0 MHz). The default is to read from data set.
- `-f` specifies that old output file is to be overwritten. The default is to not overwrite old files.
- `-olsb` or `-omsb` specifies whether the data has the least- or most-significant byte first. For AM data, the default is determined from data set. For AMX data, the default is `-olsb`.
- `-pxxx`, where `xxx` is the number of 24- or 32-bit words to skip before converting data. This option is for use with `-t` option to skip the header in AM data without converting it. Typical header sizes are 216 or 256 words. The default is 0.
- `-s3` or `-s4` specifies if AM data is 24-bit (3-byte) or 32-bit (4-byte). All AMX data is 32-bit. The default is determined from the data set.
- `-tall`, `-thdr`, or `-tdata` specifies whether `convertbru` should convert the header and the data, just the header, or just the data. The default is `-tall`.

Examples: Convert AM data from a UNIX shell (in all these examples, the file name is arbitrarily named `br_data`):

- `convertbru br_data` determines the file format and converts the header and data in the file `br_data`.
- `convertbru br_data -d250.0 -cout` determines the file format, converts the header and data in the `br_data`, sets the decoupler frequency to 250.0 MHz, and writes to an output file named `out.cv` in the current working directory.
- `convertbru br_data -thdr` determines file format and converts only the header in the file `br_data`.
- `convertbru br_data -tdata -p256 -s3 -omsb` converts only the data in `br_data` after skipping the 256-word header. The data is converted assuming it is 24-bit AM data words with the most-significant byte first.

Convert AM data from VnmrJ:

- `convertbru('br_data','-tdata','-p256','-s3', '-omsb')` converts only the data in `br_data` after skipping the 256-word header. The data is converted assuming it is 24-bit AM data words with the most-significant byte first.

Convert AMX data from a UNIX shell:

- `convertbru br_data -f` converts `acqus` and `acqu2s` files to ASCII, if needed, and then converts data and overwrites the existing `br_data.cv` file.

Convert AMX data from VnmrJ:

- `convertbru('br_data','-f')` converts `acqus` and `acqu2s` files to ASCII, if needed, and then converts data and overwrites the existing `br_data.cv` file.
- `convertbru('br_data','-c/home/vnmr1/bdata/data1')` converts `acqus` and `acqu2s` files to ASCII, if needed, and then converts the data and writes it to `/home/vnmr1/bdata/data1.cv`.

See also: *NMR Spectroscopy User Guide*

Related: `readbrutape` Read Bruker data files from 9-track tape (U)

sread	Read converted data into VnmrJ (C)
wft2da	Weight and Fourier transform phase-sensitive data (M)

copy — Copy a file (C)

Syntax: `copy(<'-r',>from_file,to_file)<:$res>`

Description: Makes a copy of a file and is identical to the `cp` command. All arguments are passed. Command will abort with no return value if an illegal file name is used.

Arguments: `'-r'` — keyword requesting a recursive copy (i.e., copy a directory).

`from_file` — name of the file (or directory if `'-r'` used) to be copied.

`to_file` — name of the copy of the file (or directory). If the `from_file` argument has an extension (e.g., `.fid`), be sure the `to_file` argument has the same extension.

`:$res` — variable to hold the result of the copy process.

1 is returned if the copy is successful.

0 is returned if the copy failed.

Examples:

```
copy('-r','/home/vnmr1/vnmrsys/seqlib','/vnmr/
seqlib')
```

```
copy('/home/vnmr1/vnmrsys/seqlib/d2pul', \
   '/vnmr/seqlib/d2pul')
```

See also: *NMR Spectroscopy User Guide*

Related:

cp	Copy a file (C)

cos — Find cosine value of an angle (C)

Syntax: `cos(angle)<:n>`

Description: Finds the cosine of an angle.

Arguments: `angle` is the angle, given in radians.

`n` is the return value with the cosine of `angle`. The default is to display the cosine value in the status window.

Examples:

```
cos(.5)
cos(val):cos_val
```

See also: *User Programming*

Related:

sin	Find sine value of an angle (C)

Cosy — Convert the parameter to a COSY experiment (M)

Description: Convert the parameter to a COSY experiment.

See also: *NMR Spectroscopy User Guide*

Related:

cosyps	Set up parameters for phase-sensitive COSY pulse sequence (M)
Dqcosy	Set up parameters for double-quantum filtered COSY (M)
relayh	Set up parameters for RELAYH pulse sequence (M)

cosyps — Set up parameters for phase-sensitive COSY pulse sequence (M)

Description: Sets up a phase-sensitive COSY (homonuclear correlation) experiment.

See also: *NMR Spectroscopy User Guide*

Related:

Cosy	Set up parameters for COSY pulse sequence (M)

Dqcosy	Set up parameters for double-quantum filtered COSY (M)
relayh	Set up parameters for RELAYH pulse sequence (M)

cp — Copy a file (C)

Syntax: `cp(<'-r',>from_file,to_file)<:$res>`

Description: Makes a copy of a file and is identical to the `copy` command. All arguments are passed. Command will abort with no return value if an illegal file name is used.

Arguments: `'-r'` is a keyword requesting a recursive copy (i.e., copy a directory).

`from_file` is the name of the file (or directory if `'-r'` used) to be copied.

`to_file` is the name of the copy of the file (or directory). If the `from_file` argument has an extension (e.g., `.fid`), be sure the `to_file` argument has the same extension.

`:$res` variable to hold the result of the copy process.

1 is returned if the copy is successfully

0 is returned if the copy failed

Examples:
```
cp('/home/vnmr1/vnmrsys/seqlib/d2pul',    \
   '/vnmr/seqlib/d2pul')
cp('-r','/home/vnmr1/vnmrsys/seqlib','/vnmr/seqlib')
```

See also: *NMR Spectroscopy User Guide*

Related:

copy	Copy a file (C)

cp — Cycle phase (P)

Description: Sets the values that real-time variable oph is calculated as, either 0,1,2,3 (`cp='y'`) or 0 (`cp='n'`). The only circumstance where setting `cp='n'` may be useful is when displaying an FID with `acqi`. If there is an imbalance between the two receiver channels, the FID displayed for `acqi` may show alternating dc levels. The standard `gf` macro that prepares parameters for the FID display in `acqi` automatically handles this issue.

Values: `'y'` makes oph calculate as 0,1,2,3; this is the typical value.
`'n'` makes oph calculate as 0.

See also: *User Programming*

Related:

acqi	Interactive acquisition display process (C)
go	Submit experiment to acquisition (C)
gf	Prepare parameters for FID/spectrum display in `acqi` (M)

cpmgt2 — Set up parameters for CPMGT2 pulse sequence (M)

Description: Macro to set up a CPMGT2 (Carr-Purcell Meiboom-Gill T_2) experiment.

See also: *NMR Spectroscopy User Guide*

Related:

t2	T_2 exponential analysis (M)

cpos_cvt — Convert data set from a VXR-style system (M,U)

Syntax: (From UNIX) `cpos_cvt VXR_file`
`convert(VXR_file)`

Description: Converts data stored on a VXR-style system (Gemini, VXR, or XL) to the format used in VnmrJ software. `cpos_cvt` writes the converted data in a subdirectory of the current working directory, using the original name of the

data set. The command convert loads the data from VXR_file into the current experiment and converts it to the new format.

Arguments: VXR_file is the file name in the VXR-style format to be converted to the VnmrJ style.

Related:

convert	Convert data set from a VXR-style system (C,U)
decomp	Decompose a VXR-style directory (C)
rt	Retrieve FIDs (C)

cptmp — Copy experiment data into experiment subfile (M)

Syntax: cptmp<(file)>

Description: Copies the data (parameters, FID, and transformed spectrum) from the current experiment into a subdirectory inside curexp+'/subexp'.

Arguments: file is the name of the subfile to receive the data. The default is to take the name from the transmitter nucleus (if seqfil='s2pul') or to use the pulse sequence name.

Examples:
```
cptmp
cptmp('cosy')
```

Related:

curexp	Current experiment directory (P)
rttmp	Retrieve experiment data from experiment subfile (M)
seqfil	Pulse sequence name (P)
svtmp	Move experiment data into experiment subfile (M)

cpx — Create pbox shape file (M)

Syntax: cpx<(ref_pw90,ref_pwr)> or cpx<('g')>

Description: Calls UNIX command Pbox, which generates the specified pulse shape or decoupling/spin locking pattern, as defined by the shapelib/Pbox.inp file.

Arguments: ref_pw90 is the reference 90° pulse width

ref_pwr is the reference power level.

'g' is a keyword that is required only when generating gradient shapes and if the file type is not specified otherwise.

Examples:
```
cpx
cpx('g')
cpx(pw90*compH,tpwr)
```

See also: *NMR Spectroscopy User Guide*

Related:

Pbox	Pulse shaping software (U)

cqexp — Load experiment from protocol (M)

Applicability: Liquids

Description: Macro to load an experiment from a protocol.

Syntax: cqexp(experiment <, apptype>)

The first argument is the experiment name, and the second argument is the apptype. If the apptype is not specified, the previous apptype is used.

Examples:
```
cqexp('Proton', 'std1d')
```

Related:
- apptype — Application type (P)
- execpars — Set up the exec parameters (M)

cqfindz0 — Run an experiment to find the value of z0 (M)

Applicability: Liquids

Description: A macro to run a deuterium experiment to find the correct value of z0 for a given solvent. It requires an entry in the probe file for the number of deuterium Hz per DAC. Run the appropriate probe calibration for lk Hz per DAC to set the value in the probe file. The macro may be accessed through the Find z0 button available on several panels.

Related:
- solvent — Lock solvent (P)
- z0 — Z0 field position (P)

cqgmap — Perform gradient shimming utility functions (M)

Applicability: Liquids

Description: Macro runs gradient shimming utility functions.

Related:
- gmapshim — Run gradient autoshimming, set parameters, map shims (M)

cqinit — Initialize liquids study queue (M)

Applicability: Liquids

Description: Initializes the liquids study queue.

Related:
- cqreset — Reset study queue parameters (M)
- sqfilemenu — Study queue file menu commands (M)

cqpars — Create study queue parameters for liquids (M)

Applicability: Liquids

Description: A macro to create study queue parameters for the Walkup interface.

See also: VnmrJ Walkup

Related:
- fixpar — Correct parameter characteristics in experiment (M)

cqplot — Macro to perform generic 2D plot (M)

Applicability: Liquids

Description: A macro to perform generic 2D plotting, including 1D experiment traces. Usually called by other macros, and not used from the command line.

Related:
- plot — Automatically plot spectra (M)
- plot2D — Plot results of 2D peak picking (C)
- plt2Darg — Plot 2D arguments (P)

cqprotocol — Macro to create protocols (M)

Applicability: Liquids

Description: A macro to create protocols for liquids applications. Called by the *Make protocols dialogs* in the Utilities menu.

cqreset — Reset study queue parameters (M)

Applicability: Liquids

Description: Reset liquids study queue parameters. Usually called by other macros when starting a new study.

Related:

cqinit	Initialize liquids study queue (M)
sqfilemenu	Study queue file menu commands (M)

cqsavestudy — Macro to save study queue parameters (M)

Applicability: Liquids

Description: A macro to save study parameters in the liquids study queue. Usually called by other macros when starting a new study.

Related:

studypar	Study parameters (P)
xmsubmit	Submit sample(s) to the study queue (M)
xmendq	End a chained study queue (M)

cqwtmenu — Macro to set weighting functions from a panel (M)

Applicability: Liquids, Imaging

Description: A macro to set weighting functions from a panel. It is used for both 1D and 2D weighting parameters. Called by processing parameter panels.

cr — Cursor position in directly detected dimension (P)

Description: Contains the current cursor position. The rl macro uses cr to set the reference line.

See also: *NMR Spectroscopy User Guide*

Related:

centersw	Move cursor to center of spectrum (M)
crf	Current time-domain cursor position (P)
crl	Clear ref. line in directly detected dimension (M)
delta	Difference of two frequency cursors (P)
rl	Set reference line in directly detected dimension (M)

cr1 — Cursor position in 1st indirectly detected dimension (P)

Description: Contains the current cursor position along the first indirectly detected dimension. Analogous to the cr parameter except that cr1 applies to the first indirectly detected dimension of a multidimensional data set. The rl1 macro uses cr1 to set the reference line along this dimension.

See also: *NMR Spectroscopy User Guide*

Related:

centersw1	Move cursor to center of spectrum in 1st indirect dimension (M)
cr	Cursor position in directly detected dimension (P)
cr2	Cursor position in 2nd indirectly detected dimension (P)
rl1	Set ref. line in 1st indirectly detected dimension (M)

C

cr2 — Cursor position in 2nd indirectly detected dimension (P)

Description: Contains the current cursor position along the second indirectly detected dimension. Analogous to the cr parameter except that cr2 applies to the second indirectly detected dimension of a multidimensional data set. The rl2 macro uses cr2 to set the reference line along this dimension.

See also: *NMR Spectroscopy User Guide*

Related:

centersw2	Move cursor to center of spectrum in 2nd indirect dimension (M)
cr	Cursor position in directly detected dimension (P)
cr1	Cursor position in 1st indirectly detected dimension (P)
rl2	Set ref. line in 2nd indirectly detected dimension (M)

crcom — Create user macro without using text editor (M)

Syntax: `crcom(file,actions)`

Description: Creates a macro file in the user's macro library (maclib) with the contents given in the actions argument.

Arguments: file is the file name of the user macro to be created. If a macro of the same name already exists, the user is asked whether or not to overwrite it.

actions is a string containing the actions making up the user macro. The string cannot include a carriage return. If a single quote is needed within the string, it must be preceded by a backslash (see second example below).

Examples:

```
crcom('plot','pl pscale pap page')
crcom('lds','load=\'y\' su load=\'n\'')
```

See also: *User Programming*

create — Create new parameter in a parameter tree (C)

Syntax: `create(parameter<,type<,tree>>)`

Description: Creates a parameter in one of the parameter trees. A *parameter tree* is a UNIX file containing the attributes of parameters as formatted text. Refer to the command paramvi for a description of the file contents.

Arguments: parameter is the name of the parameter to be created.

type is the type of values in the parameter to be created and can be one of the following values (default is 'real'):

- 'real' is a value with no limits on range and can be positive or negative.
- 'string' is a value composed of characters. Entry of strings can be limited to selected words by enumerating the possible values with the command setenumeral. For example, the enumerated values of intmod are 'off', 'partial', and 'full'. Therefore, intmod can be set only to one of these three string values, such as intmod='full'.
- 'delay' is a value from 0 to 8190, in unit of seconds.
- 'frequency' is a positive real number value.
- 'flag', like 'string', is a value composed of characters. Entry of flags can be limited to selected characters by enumerating the possible values with the command setenumeral. For example, the enumerated values of dmm are 'c', 'f', 'g', 'm', 'p', 'r', 'u', 'w', and 'x'. Therefore, dmm can only be set to a combinations of these nine characters, such as dmm='ccw'. If enumerated values are not set, the 'string' and 'flag' types are identical.
- 'pulse' is a value from 0 to 8190, in units of µs.

- 'integer' is a value composed of integers (0,1,2,3,...).

tree is one of the following types of parameter trees (default is 'current'):

- 'current' contains parameters that are adjusted to set up an experiment. The parameters are from the file curpar in the current experiment.
- 'global' contains user-specific parameters from the file global in the vnmrsys directory of the present UNIX user.
- 'processed' contains parameters with which the data was obtained. These parameters are from the file procpar in the current experiment.
- 'systemglobal' contains instrument-specific parameters from the text file /vnmr/conpar. Most of these parameters are defined using the config program. All users have the same systemglobal tree. Note that conpar is not written out when you exit; the only time conpar is ever modified is by the config program. Thus, any changes you make to conpar using create (or destroy, setvalue, etc.) are not permanent. To permanently create a parameter in conpar, you must use a text editor to change /vnmr/conpar.

Examples:
```
create('a')
create('b','string')
create('c','real','global')
```

See also: *User Programming*

Related:

destroy	Destroy a parameter (C)
display	Display parameters and their attributes (C)
fread	Read parameters from file and load them into a tree (C)
fsave	Save parameters from a tree to a file (C)
paramvi	Edit a parameter and its attributes using vi text editor (M)
prune	Prune extra parameters from current tree (C)
setenumeral	Set values of a string variable in a tree (C)
setgroup	Set group of a parameter in a tree (C)
setprotect	Set protection mode of a parameter (C)

createqcomp — Create qcomp parameter (M)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Macro to create the qcomp parameter with the appropriate attributes. qcomp is created as a flag parameter in the global tree.

crf — Current time-domain cursor position (P)

Description: Contains current time-domain cursor position. To create crf and the other FID display parameters axisf, dotflag, vpf, vpfi, and deltaf (if the parameter set is older and lacks these parameters), enter addpar('fid').

Values: Number, in seconds.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
crl1	Clear ref. line in 1st indirectly detected dimension (C)
deltaf	Difference of two time cursors (P)
fidpar	Add parameters for FID display in current experiment (M)

C

crl — Clear reference line in directly detected dimension (M)

Description: Clears frequency referencing along the directly detected dimension by setting the reference parameters rfl and rfp to zero. crl also resets the referencing parameters refpos and reffrq.

See also: *NMR Spectroscopy User Guide*

Related:

crl1	Clear ref. line in 1st indirectly detected dimension (C)
crl2	Clear ref. line in 2nd indirectly detected dimension (C)
rl	Set ref. line in directly detected dimension (M)
reffrq	Reference frequency of reference line (P)
refpos	Position of reference frequency (P)
rfl	Ref. peak position in directly detected dimension (P)
rfp	Ref. peak frequency in directly detected dimension (P)

crl1 — Clear reference line in 1st indirectly detected dimension (M)

Description: Clears frequency referencing along the first indirectly detected dimension by setting the reference parameters rfl1 and rfp1 to zero. crl1 also resets the referencing parameters refpos1 and reffrq1.

See also: *NMR Spectroscopy User Guide*

Related:

crl	Clear ref. line in directly detected dimension (C)
rl1	Set ref. line in 1st indirectly detected dimension (M)
reffrq1	Ref. frequency of reference line in 1st indirect dimension (P)
refpos1	Position of reference frequency in 1st indirect dimension (P)
rfl1	Ref. peak position in 1st indirectly detected dimension (P)
rfp1	Ref. peak frequency in 1st indirectly detected dimension (P)

crl2 — Clear reference line in 2nd indirectly detected dimension (M)

Description: Clears frequency referencing along the second indirectly detected dimension by setting the reference parameters rfl2 and rfp2 to zero. crl2 also resets the referencing parameters refpos2 and reffrq2.

See also: *NMR Spectroscopy User Guide*

Related:

crl	Clear ref. line in directly detected dimension (C)
rl2	Set ref. line in 2nd indirectly detected dimension (M)
reffrq2	Ref. frequency of reference line in 2nd indirect dimension (P)
refpos2	Position of reference frequency in 2nd indirect dimension (P)
rfl2	Ref. peak position in 2nd indirectly detected dimension (P)
rfp2	Ref. peak frequency in 2nd indirectly detected dimension (P)

crmode — Current state of the cursors in df, ds, or dconi programs (P)

Description: Stores the current state (box mode or cursor mode) of cursors in the df, ds, or dconi interactive display programs. crmode is mostly used by programmable menus to determine the status of the cursors. It is stored in the file vnmrsys/global.

Values: 'b' signifies the box mode, 'c' signifies the cursor mode.

See also: *User Programming*

Related:

dconi	Interactive 2D data display (C)
df	Display a single FID (C)
ds	Display a spectrum (C)

crof2 — Recalculate rof2 so that lp = 0 (M)

Syntax: `crof2<(alfa)>`

Description: Recalculates a new value for `rof2` (receiver gating time following a pulse) based upon the current `rof2` and `lp` (first-order phase) values, so that `lp` is rendered approximately 0. For `crof2` to work properly, a trial spectrum must be obtained and phased to pure absorption. This spectrum provides the current `rof2` and `lp` values for `crof2`. The value of the `alfa` delay is left constant, provided `rof2` does not become less than 1 µs.

`crof2` pertains to processing 2D data. Unless `lp` is approximately 0, `fpmult` affects both the dc offset and the curvature of the spectrum.

Arguments: `alfa` specifies a value for the `alfa` delay before acquisition.

Related:		
	`alfa`	Set `alfa` delay before acquisition (P)
	`cfpmult`	Calculate first point multiplier for `2D experiments` (P)
	`fpmult`	First point multiplier for `np` FID data (P)
	`lp`	First-order phase along directly detected dimension (P)
	`rof2`	Receiver gating time following a pulse (P)

cryo_noisetest — Run Cold Probe conditioning experiments (M)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Runs the probe conditioning experiments and analyzes the noise using the `cnd` macro. Measures the hydrogen-induced noise and provides an efficient remedy.

Values: `NOBURN` – waits the operator input period of time between tests.
No arguments – macro will prompt for a time in minutes.

cryoclient — Start the CryoBay Monitor program (M, U)

Applicability: Systems with Cold Probes and CryoBay Monitor software.

Description: Starts the CryoBay Monitor software in a separate window. This program is a CORBA client that requires an active CORBA server running on the CryoBay PC.

See also: *Cryogenic Systems Installation and Operation*

ct — Completed transients (P)

Description: Stores a nonuser-enterable informational parameter that changes during the course of an experiment to reflect the number of completed transients. During most experiments, an accurate transient counter is displayed in the acquisition status window, updated every five seconds.

The value of `ct` is displayed in the acquisition parameter group by the `dg` command and is only updated when data processing occurs on the FID. In an experiment that is accumulating and not processed until the acquisition is complete, `ct` always indicates `0` until the end of the acquisition.

See also: *NMR Spectroscopy User Guide*

Related:		
	`dg`	Display parameters of acquisition/processing group (C)

ctext — Clear the text of the current experiment (C)

Description: Clears the text from the current experiment text file (a block of text that may be used to describe the sample and experiment).

See also: *NMR Spectroscopy User Guide*

Related:		
	`atext`	Append string to the current experiment text (M)
	`text`	Display text or set new text for current experiment (C)

`curexp` Current experiment directory (P)

Description: Contains the full UNIX path to the currently active experiment. This parameter is useful when accessing text files generated by various commands (e.g., `cat(curexp+'/fp.out')`).

See also: *NMR Spectroscopy User Guide*

Related:		
	`systemdir`	VnmrJ system directory (P)
	`userdir`	VnmrJ user directory (P)

`curscan` Scan currently in progress (P)

Applicability: Systems with LC-NMR accessory.

Description: Keeps track of which "scan" is currently in progress. If `curscan` does not exist, the `parlc` macro can create it.

See also: *NMR Spectroscopy User Guide*

Related:		
	`parlc`	Create LC-NMR parameters (M)

`curwin` Current window (P)

Description: An arrayed global parameter. The first value is the index of the selected window pane in the graphics window. The second value is the number of window pane rows. The third value is the number of columns.

See also: *NMR Spectroscopy User Guide*

Related:		
	`fontselect`	Open FontSelect window (C)
	`jwin`	Activate current window (M)
	`mapwin`	List of experiment numbers (P)
	`setgrid`	Activate selected window (M)
	`setwin`	Activate selected window (C)

`cutoff` Data truncation limit (P)

Description: Defines the distance above and below the current vertical position `vp` at which spectra and integrals are truncated. By arraying `cutoff` to have two different values, the truncation limits above and below the current vertical position can be controlled independently (e.g., `cutoff=50` truncates data at `vp+50` mm and `vp-50` mm, and `cutoff=50,10` truncates data at `vp+50` mm and `vp-10` mm). `cutoff='n'` disables the action of `cutoff`.

`cutoff` is not active during interactive spectral displays (i.e., for the `ds` command), but is active during non-interactive spectral displays and plots (for the `dss` and `pl` commands).

Values: `'n'`, number in mm.

See also: *NMR Spectroscopy User Guide*

Related:		
	`ds`	Display a spectrum (C)
	`dss`	Display stacked spectra (C)
	`pl`	Plot spectra (C)
	`vp`	Vertical position of spectrum (P)

cyclenoe **Set up parameters for CYCLENOE pulse sequence (M)**

Applicability: Systems in which the observe channel is equipped with direct synthesis rf and a linear amplifier.

Description: Sets up a difference NOE experiment.

cylbr24 **Set up parameters for cycled BR24 pulse sequence (M)**

Applicability: Systems with solids module.

Description: Sets up a BR24 sequence with quadrature detection and prepulse for solids multiple-pulse line narrowing.

See also: *User Guide: Solid-State NMR*

Related: `br24` Set up parameters for BR24 pulse sequence (M)

cylmrev **Set up parameters for cycled MREV8 pulse sequence (M)**

Applicability: Systems with a solids module.

Description: Sets up a MREV8 sequence with quadrature detection and prepulse for solids multiple-pulse line narrowing.

See also: *User Guide: Solid-State NMR*

Related: `mrev8` Set up parameters for MREV8 pulse sequence (M)

cz **Clear integral reset points (C)**

Syntax: `cz<(frequency1,frequency2,...)>`

Description: Removes currently defined integral reset points.

Arguments: `frequency1,frequency2,...` are reset points corresponding to specified frequencies to be removed. The default is remove all reset points.

Examples:
```
cz
cz(800,600,250,60)
```

See also: *NMR Spectroscopy User Guide*

Related
- `dli` Display listed integral values (C)
- `dlni` Display listed normalized integral values (C)
- `nli` Find normalized integral values (C)
- `z` Add integral reset point at the cursor position (C)

C

D

d0	Overhead delay between FIDs (P)
d1	First delay (P)
d2	Incremented delay in 1st indirectly detected dimension (P)
d2pul	Set up parameters for D2PUL pulse sequence (M)
d3	Incremented delay for 2nd indirectly detected dimension (P)
d4	Incremented delay for 3rd indirectly detected dimension (P)
DAC_to_G	Store gradient calibration value in DOSY sequences (P)
da	Display acquisition parameter arrays (C)
daslp	Increment for t1 dependent first-order phase correction (P)
date	Date (P)
daxis	Display horizontal LC axis (M)
Dbppste	Set up parameters for Dbppste pulse sequence (M)
Dbppsteinept	Set up parameters for Dbppsteinept pulse sequence (M)
dbsetup	Set up VnmrJ database (U)
dbupdate	Update the VnmrJ database (U)
dc	Calculate spectral drift correction (C)
dc2d	Apply drift correction to 2D spectra (C)
dcg	Drift correction group (P)
dcon	Display non interactive color intensity map (C)
dconi	Interactive 2D data display (C)
dconi	Control display selection for the dconi program (P)
dconn	Display color intensity map without screen erase (C)
dcrmv	Remove dc offsets from FIDs in special cases (P)
ddf	Display data file in current experiment (C)
ddff	Display FID file in current experiment (C)
ddfp	Display phase file in current experiment (C)
ddif	Synthesize and show DOSY plot (C)
ddrcr	Direct digital receiver coefficient ratio (P)
ddrpm	Set ddr precession mode (P)
ddrtc	Set ddr time constant (P)
dds	Default display (M)
dds_*seqfil*	Sequence-specific default display (M)
debug	Trace order of macro and command execution (C)
decasynctype	Select the type of decoupler asynchronous mode (P)
deccwarnings	Control reporting of DECC warnings from PSG (P)
decomp	Decompose a VXR-style directory (M)
def_osfilt	Default value of osfilt parameter (P)
defaultdir	Default directory for Files menu system (P)
delcom	Delete a user macro (M)
delete	Delete a file, parameter directory, or FID directory (C)
delexp	Delete an experiment (M)
deletenucleus	Removes nucleus entry to probe file (M)
dels	Delete spectra from T_1 or T_2 analysis (C)

D

delta	Cursor difference in directly detected dimension (P)
delta1	Cursor difference in 1st indirectly detected dimension (P)
delta2	Cursor difference in 2nd indirectly detected dimension (P)
deltaf	Difference of two time-domain cursors (P)
Dept	Set up parameters for DEPT experiment (M)
deptgl	Set up parameters for DEPTGL pulse sequence (M)
deptproc	Process array of DEPT spectra (M)
destroy	Destroy a parameter (C)
destroygroup	Destroy parameters of a group in a tree (C)
df	Display a single FID (C)
df2d	Display FIDs of 2D experiment (C)
dfid	Display a single FID (C)
dfmode	Current state of display of imaginary part of a FID (P)
dfrq	Transmitter frequency of first decoupler (P)
dfrq2	Transmitter frequency of second decoupler (P)
dfrq3	Transmitter frequency of third decoupler (P)
dfrq4	Transmitter frequency of fourth decoupler (P)
dfs	Display stacked FIDs (C)
dfsa	Display stacked FIDs automatically (C)
dfsan	Display stacked FIDs automatically without screen erase (C)
dfsh	Display stacked FIDs horizontally (C)
dfshn	Display stacked FIDs horizontally without screen erase (C)
dfsn	Display stacked FIDs without screen erase (C)
dfww	Display FIDs in whitewash mode (C)
dg	Display group of acquisition/processing parameters (C)
dg	Control dg parameter group display (P)
dg1	Display group of display parameters (M)
dg1	Control dg1 parameter group display (P)
dg2	Display group of 3rd and 4th rf channel/3D parameters (M)
dg2	Control dg2 parameter group display (P)
dga	Display group of spin simulation parameters (M)
DgcsteSL	Set up parameters for DgcsteSL pulse sequence (M)
Dgcstecosy	Set up parameters for Dgcstecosy pulse sequence (M)
Dgcstehmqc	Set up parameters for Dgcstehmqc pulse sequence (M)
dglc	Display group of LC-NMR parameters (M)
dglc	Control `dglc` parameter group display (P)
dglp	Control `dglp` parameter group of linear prediction parameters (P)
dgs	Display group of shims and automation parameters (M)
dgs	Control dgs parameter group display (P)
dhp	Decoupler high-power control with class C amplifier (P)
dialog	Display a dialog box from a macro (C)
diffparams	Report differences between two parameter sets (U)
diffshims	Compare two sets of shims (M,U)
digfilt	Write digitally filtered FIDs to another experiment (M)
dir	List files in directory (C)
display	Display parameters and their attributes (C)
dla	Display spin simulation parameter arrays (M)

dlalong	Long display of spin simulation parameter arrays (C)
dli	Display list of integrals (C)
dlivast	Produce text file and process wells (M)
dll	Display listed line frequencies and intensities (C)
dlni	Display list of normalized integrals (M)
dlp	Decoupler low-power control with class C amplifier (P)
dm	Decoupler mode for first decoupler (P)
dm2	Decoupler mode for second decoupler (P)
dm3	Decoupler mode for third decoupler (P)
dm4	Decoupler mode for fourth decoupler (P)
dmf	Decoupler modulation frequency for first decoupler (P)
dmf2	Decoupler modulation frequency for second decoupler (P)
dmf3	Decoupler modulation frequency for third decoupler (P)
dmf4	Decoupler modulation frequency for fourth decoupler (P)
dmfadj	Adjust tip-angle resolution time for first decoupler (M)
dmf2adj	Adjust tip-angle resolution time for second decoupler (M)
dmf3adj	Adjust tip-angle resolution time for third decoupler (M)
dmf4adj	Adjust tip-angle resolution time for fourth decoupler (M)
dmg	Data display mode in directly detected dimension (P)
dmg1	Data display mode in 1st indirectly detected dimension (P)
dmg2	Data display mode in 2nd indirectly detected dimension (P)
dmgf	Absolute-value display of FID data or spectrum in acqi (P)
dmm	Decoupler modulation mode for first decoupler (P)
dmm2	Decoupler modulation mode for second decoupler (P)
dmm3	Decoupler modulation mode for third decoupler (P)
dmm4	Decoupler modulation mode for fourth decoupler (P)
dn	Nucleus for first decoupler (P)
dn2	Nucleus for second decoupler (P)
dn3	Nucleus for third decoupler (P)
dn4	Nucleus for fourth decoupler (P)
dndfid	Retrieve and process fid data from the locator (M)
dndjoin	Join a work space from the locator (M)
dndpar	Retrieve a parameter set from the locator (M)
dndshims	Retrieve a shimset set from the locator (M)
dnode	Display list of valid limNET nodes (M,U)
doautodialog	Start a dialog window using `def` file (M)
dodialog	Start a dialog window with `dialoglib` file (M)
dof	Frequency offset for first decoupler (P)
dof2	Frequency offset for second decoupler (P)
dof3	Frequency offset for third decoupler (P)
dof4	Frequency offset for fourth decoupler (P)
Doneshot	Set up parameters for Doneshot pulse sequence (M)
dopardialog	Start a dialog with `dialoglib/experiment def` file (M)
do_pcss	Calculate proton chemical shifts spectrum (C)
dosy	Process DOSY experiments (M)
dosy2d	Apptype macro for dosy 2D experiments (M)
dosyfrq	Larmor frequency of phase encoded nucleus in DOSY (P)

D

dosygamma	Gyromagnetic constant of phase encoded nucleus in DOSY (P)
dosytimecubed	Gyromagnetic constant of phase encoded nucleus in DOSY (P)
dot1	Set up a T_1 experiment (M)
dotflag	Display FID as connected dots (P)
downsamp	Downsampling factor applied after digital filtering (P)
dp	Double precision (P)
dpcon	Display plotted contours (C)
dpconn	Display plotted contours without screen erase (C)
dpf	Display peak frequencies over spectrum (C)
dpir	Display integral amplitudes below spectrum (C)
dpirn	Display normalized integral amplitudes below spectrum (M)
dpiv	Display integral amplitudes below spectrum (M)
dpirn	Display normalized integral amplitudes below spectrum (C)
dpl	Default plot (M)
dpl_*seqfil*	Sequence-specific default plot (M)
dplane	Display a 3D plane (M)
dpr	Default process (M)
dpr_*seqfil*	Sequence-specific default process (M)
dprofile	Display pulse excitation profile (M)
dproj	Display a 3D plane projection (M)
dps	Display pulse sequence (C)
dpwr	Power level for first decoupler with linear amplifier (P)
dpwr2	Power level for second decoupler with linear amplifier (P)
dpwr3	Power level for third decoupler with linear amplifier (P)
dpwr4	Power level for fourth decoupler amplifier (P)
dpwrf	First decoupler fine power (P)
dpwrf2	Second decoupler fine power (P)
dpwrf3	Third decoupler fine power (P)
dpwrm	First decoupler linear modulator power (P)
dpwrm2	Second decoupler linear modulator power (P)
dpwrm3	Third decoupler linear modulator power (P)
Dqcosy	Convert the parameter to a DQCOSY experiment (M)
draw	Draw line from current location to another location (C)
dres	Measure linewidth and digital resolution (C)
dres	Tip-angle resolution for first decoupler (P)
dres2	Tip-angle resolution for second decoupler (P)
dres3	Tip-angle resolution for third decoupler (P)
dres4	Tip-angle resolution for fourth decoupler (P)
ds	Display a spectrum (C)
ds2d	Display 2D spectra in whitewash mode (C)
ds2dn	Display 2D spectra in whitewash mode without screen erase (C)
dsnarray	Report statistical signal-to-noise for Cold Probes (M)
dscale	Display scale below spectrum or FID (C)
dscoef	Digital filter coefficients for downsampling (P)
dseq	Decoupler sequence for first decoupler (P)
dseq2	Decoupler sequence for second decoupler (P)
dseq3	Decoupler sequence for third decoupler (P)

dseq4	Decoupler sequence for fourth decoupler (P)
dsfb	Digital filter bandwidth for downsampling (P)
dshape	Display pulse shape or modulation pattern (M)
dshapef	Display last generated pulse shape (M)
dshapei	Display pulse shape or modulation pattern interactively (M)
dshim	Display a shim “method” string (M)
dslsfrq	Bandpass filter offset for downsampling (P)
dsn	Measure signal-to-noise (C)
dsnmax	Calculate maximum signal-to-noise (M)
dsp	Display calculated spectrum (C)
dsp	Type of DSP for data acquisition (P)
dsplanes	Display a series of 3D planes (M)
dsptype	Type of DSP (P)
dss	Display stacked spectra (C)
dssa	Display stacked spectra automatically (C)
dssan	Display stacked spectra automatically without erasing (C)
dssh	Display stacked spectra horizontally (C)
dsshn	Display stacked spectra horizontally without erasing (C)
dssl	Label a display of stacked spectra (M)
dssn	Display stacked spectra without screen erase (C)
dsvast	Display VAST data in a stacked 1D-NMR matrix format (M)
dsvast2d	Display VAST data in a pseudo-2D format (M)
dsww	Display spectra in whitewash mode (C)
dtext	Display a text file in graphics window (M)
dtrig	Delay to wait for another trigger or acquire a spectrum (P)
dutyc	Duty cycle for homodecoupling (optional) (P)

d0 — Overhead delay between FIDs (P)

Description: Defines the extra overhead delay at the start of each FID or array element. Overhead times between increments and transients are deterministic, i.e., both known and constant. However, the time between increments (typically `x`) is longer than the time between transients (`y`, not including times that are actually part of the pulse sequence, such as `d1`). Some experiments may benefit if it is ensured that these two times are not only constant but equal. To ensure that the times are constant and equal, insert the time `d0` at the start of each transient (before the pulse sequence actually starts); the actual delay is then `y+d0`. However, the overhead time may differ with different system configurations. To keep the `d0` delay consistent across systems, set `d0` greater than the overhead delay. The inter-FID delay `x` is then padded so that `y+d0=x+(d0-(x-y))`.

Currently, `d0` only takes into account the extra delay at the start of each array element. It does not take into account the overhead delays at the start and end of each scan. It also does not take into account delays when arraying `status` statements, shims, or spinner speeds.

The `d0` parameter does not exist in any parameter set and must be created by the user. To create `d0`, enter `create('d0','delay')`. If `d0` is nonexistent, do not insert a delay between transients.

Values: `'n'`, `'y'`, or `0` to the maximum delay time (in seconds).

If d0='n', the software calculates the overhead time for an array element and then delays that length of time at the beginning of subsequent transients for every array element. The calculated value of d0 can be viewed by entering d0='y' in the input window.

If d0 is set to a value, that value is the length of delay time at the beginning of subsequent transients for every array element. If the value is greater than the array overhead time, the array overhead time is padded to d0.

See also: *User Programming*

Related:

create	Create new parameter in parameter tree (C)

d1 First delay (P)

Description: Length of the first delay in the standard two-pulse sequence and most other pulse sequences. This delay is used to allow recovery of magnetization back to equilibrium, if such a delay is desired.

Values: 0.1 µs to 8190 sec, smallest value possible is 0.1 µs, finest increment possible is 12.5 ns.

See also: *NMR Spectroscopy User Guide*

Related:

alfa	Set alfa delay before acquisition (P)
d2	Incremented delay in 1st indirectly detected dimension (P)
d3	Incremented delay in 2nd indirectly detected dimension (P)
d4	Incremented delay in 3rd indirectly detected dimension (P)
pad	Preacquisition delay (P)

d2 Incremented delay in 1st indirectly detected dimension (P)

Description: Length of the second delay in the standard two-pulse sequence. The delay is controlled by the parameters ni and sw1 in a 2D experiment.

Values: 0.1 µs to 8190 sec, smallest value possible is 0.1 µs, finest increment possible is 12.5 ns.

See also: *NMR Spectroscopy User Guide*

Related:

d1	First delay (P)
ni	Number of increments in 1st indirectly detected dimension (P)
sw1	Spectral width in 1st indirectly detected dimension (P)

d2pul Set up parameters for D2PUL pulse sequence (M)

Description: Sets up a standard two-pulse sequence using the decoupler as transmitter.

See also: *NMR Spectroscopy User Guide*

Related:

dhp	Decoupler high power with class C amplifier (P)
dn	Nucleus for the first decoupler (P)
dof	Frequency offset for first decoupler (P)
dpwr	Power level for first decoupler with linear amplifiers (P)
s2pul	Set up parameters for standard two-pulse sequence (M)
tn	Nucleus for the observe transmitter (P)
tof	Frequency offset for observe transmitter (P)
tpwr	Power level of observe transmitter with linear amplifiers (P)

d3 Incremented delay for 2nd indirectly detected dimension (P)

Description: Length of a delay controlled by the parameters ni2 and sw2 in a 3D experiment. The d2 delay, which is controlled by ni and sw1, is incremented

through its entire implicit array first before d3 is incremented. To create parameters d3, ni2, phase2, and sw2 to acquire a 3D data set in the current experiment, enter addpar('3d').

Values: 0.1 µs to 8190 sec, smallest value possible is 0.1 µs, finest increment possible is 12.5 ns.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
d1	First delay (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
par3d	Create 3D acquisition, processing, display parameters (C)
phase2	Phase selection for 3D acquisition (P)
sw2	Spectral width in 2nd indirectly detected dimension (P)

d4 — Incremented delay for 3rd indirectly detected dimension (P)

Description: Length of a delay controlled by the parameters ni3 and sw3 in a 4D experiment. The d3 delay, which is controlled by ni2 and sw2, is incremented through its entire implicit array first before d4 is incremented. To create parameters d4, ni3, phase3, and sw3 to acquire a 4D data set in the current experiment, enter addpar('4d').

Values: 0.1 µs to 8190 sec, smallest value possible is 0.1 µs, finest increment possible is 12.5 ns.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
d1	First delay (P)
ni3	Number of increments in 3rd indirectly detected dimension (P)
par4d	Create 4D acquisition parameters (C)
phase3	Phase selection for 4D acquisition (P)
sw3	Spectral width in 3rd indirectly detected dimension (P)

DAC_to_G — Store gradient calibration value in DOSY sequences (P)

Description: DAG_to_G is automatically set by the setup_dosy macro by retrieving the gradient strength from the probe calibration file if probe<>'' and storing it in DAC_to_G. If probe=' '(i.e., the probe is not defined), then DAC_to_G is set to the current value of the global parameter gcal

See also: *NMR Spectroscopy User Guide*.

Related:

dosy	Process DOSY experiments (M)
setup_dosy	Set up gradient levels for DOSY experiments (M)
setgcal	Set the gradient calibration constant (M)

da — Display acquisition parameter arrays (C)

Syntax: da<(par1<,par2><,par3...>)>

Description: Displays arrayed acquisition parameters.

Arguments: par1,par2,par3,... are names of parameters to be displayed.The default is to display all such parameters.

Examples:

```
da
da('d2')
```

See also: *NMR Spectroscopy User Guide*

Related:

dg	Display parameters of acquisition/processing group (C)

D

daslp — Increment for t1 dependent first-order phase correction (P)

Description: Causes "shearing" of f_1 traces of a 2D dataset and is used to rotate the narrow projection of some solids correlations into the f_1 dimension. Several solids experiments for Dynamic Angle Spinning (DAS) and a triple-quantum filtered 2D MAS experiment require the use of `daslp`. (Note that the command `rotate` shears two traces and is inapplicable for these experiments.)

When created, the value of `lp` for each increment of a 2D experiment is incremented by the value of `daslp` after the first Fourier transformation. The incremented phase correction is applied to the interferogram created from the coefficient table by `ft1d`, `ft2d`, `wft1d` and `wft2d`, when coefficients are present. `daslp` is also used with `ft1da`, `ft2da`, `wft1da` and `wft2da`.

Values: Real values, typically similar in size to the value of parameter `lp`.

See also: *NMR Spectroscopy User Guide*

Related:

`ft1d`	Fourier transform along f_2 dimension (C)
`ft1da`	Fourier transform phase-sensitive data (M)
`ft2d`	Fourier transform 2D data (C)
`ft2da`	Fourier transform phase-sensitive data (M)
`lp`	First-order phase in directly detected dimension (P)
`rotate`	Rotate 2D data (C)
`wft1d`	Weight and Fourier transform f2 for 2D data (C)
`wft1da`	Weight and Fourier transform phase-sensitive data (M)
`wft2d`	Weight and Fourier transform 2D data (C)
`wft2da`	Weight and Fourier transform phase-sensitive data (M)

date — Date (P)

Description: An informational parameter taken from the UNIX-level calendar (which is set by the UNIX system operator only and cannot be entered by the user). Whenever data are acquired, the date is copied from UNIX and written into the acquisition parameters, thus maintaining a record of the date of acquisition.

See also: *NMR Spectroscopy User Guide*

daxis — Display horizontal LC axis (M)

Applicability: Systems with LC-NMR accessory.

Syntax: `daxis(time,major_tic,minor_tic)`

Description: Displays a horizontal LC axis. Horizontal axes are assumed to be used with "LC plots" of an entire LC run and are labeled accordingly.

Arguments: `time` is the time scale, in minutes (decimal values are fine), of the axis.

`major_tic` is spacing, in minutes (decimal values are fine), of major tics.

`minor_tic` is spacing, in minutes (decimal values are fine), of minor tics.

See also: *NMR Spectroscopy User Guide*

Related:

`paxis`	Display horizontal LC axis (M)

Dbppste — Set up parameters for Dbppste pulse sequence (M)

Description: Converts a parameter set to Dbppste experiment; replaces the macro `bppste`.

See also: *NMR Spectroscopy User Guide*

Related:

`dosy`	Process DOSY experiments (M)
`fiddle`	Perform reference deconvolution (M)
`setup_dosy`	Set up gradient levels for DOSY experiments (M)

Dbppsteinept — Set up parameters for Dbppsteinept pulse sequence (M)

Description: Converts a parameter set to Dbppsteinept experiment.

See also: *NMR Spectroscopy User Guide*

Related:

dosy	Process DOSY experiments (M)
fiddle	Perform reference deconvolution (M)
setup_dosy	Set up gradient levels for DOSY experiments (M)

dbsetup — Set up VnmrJ database (U)

Syntax:
```
dbsetup <vnmr_adm|remove|standard|imaging>
dbsetup vnmr_adm <remove|standard|imaging>
```
As Root:
```
dbsetup vnmr_adm VnmrJ_Home_dir <standard|imaging>
```

Arguments:
`vnmr_adm` is the login ID of the VnmrJ system administrator.
`remove` only removes the data-database; does not recreate a database.
`standard` creates the database for standard use.
`imaging` creates the database for imaging spectroscopy.

Description: The UNIX script `dbsetup` is used during the installation of VnmrJ software and can only be run by the VnmrJ administrator (`vnmr_adm`) or the UNIX administrator (`root`). Normally it is never used again. `dbsetup` creates and deletes the data-database in `/vnmr/pgsql/data` and the user information in `/vnmr/adm/users`.

When run as `root` at least two arguments must be supplied, the login ID of the VnmrJ administrator and the VnmrJ home directory. When run as root `dbsetup` will delete and recreate the data-database in `/vnmr/pgsql/data` for all users in `/vnmr/adm/users`. If no user list exists yet, the list is created with the VnmrJ administrator as the only user. The mode can be specified with the third argument as `'standard'` or `'imaging'`; if neither is specified the mode is taken from the `global` file of the VnmrJ administrator. It defaults to standard. The VnmrJ administrator does not need to supply any of the arguments.

Note that additional users are created using `vnmrj adm`.

Examples:
```
dbsetup
dbsetup vnmr1
```

See also:
NMR Spectroscopy User Guide
VnmrJ Imaging NMR
VnmrJ Installation and Administration

dbupdate — Update the VnmrJ database (U)

Applicability: Systems with the VnmrJ software.

Syntax:
```
dbsupdate stop|once [slow_ms]|forever [slow_ms]
```

Arguments:
`slow_ms` is an optional argument used to slow down the database update so as not to use all of the available CPU time. `slow_ms=0` is full speed. `slow_ms=1000` uses about 2-5% of the CPU.
The `dbupdate` command is runs under `nice` so that any other process will be able to take the CPU away from this update anyway. The default `slow_ms` for `forever` is `1000`. The default `slow_ms` for `once` is `0`.

Description: A UNIX command to start and stop a program to update the VnmrJ database used by the Locator. This command might be needed at a data station to view newly acquired data. The database at the spectrometer will automatically be updated.

D

dc — Calculate spectral drift correction (C)

Description: Turns on a linear baseline correction. The beginning and end of the straight line to be used for baseline correction are determined from the display parameters `sp` and `wp`. `dc` applies this correction to the spectrum and stores the definition of the straight line in the parameters `lvl` (level) and `tlt` (tilt). The correction is turned off by the command `cdc`.

Care must be taken to ensure that a resonance does not appear too close to either end of the spectrum, or `dc` can produce the opposite effect from that intended; namely, it induces a sloping baseline where none was present!

See also: *NMR Spectroscopy User Guide*

Related:

`bc`	1D and 2D baseline correction (C)
`cdc`	Cancel drift correction (C)
`dc`	Drift correction group (P)
`lvl`	Zero-order baseline correction (P)
`sp`	Start of plot (P)
`tlt`	First-order baseline correction (P)
`wp`	Width of plot (P)

dc2d — Apply drift correction to 2D spectra (C)

Syntax: `dc2d('f1'|'f2')`

Description: Computes a drift correction and applies it to each individual trace.

Arguments: `'f1'` is a keyword to apply drift correction in the f_1 axis direction.

`'f2'` is a keyword to apply drift correction in the f_2 axis direction.

Examples:
```
dc2d('f1')
dc2d('f2')
```

See also: *NMR Spectroscopy User Guide*

Related:

`axis`	Axis label for displays and plots (P)
`bc`	1D and 2D baseline correction (C)

dcg — Drift correction group (P)

Description: Contains the results of the `dc` or `cdc` command. This parameter cannot be set in the usual way but it can be queried by entering `dcg?` to determine whether drift correction is active.

Values: `'dc'` indicates drift correction is active.
`'cdc'` indicates drift correction is inactive.

See also: *NMR Spectroscopy User Guide*

Related:

`cdc`	Cancel drift correction (C)
`dc`	Calculate spectral drift correction (C)

dcon — Display noninteractive color intensity map (C)

Syntax: `dcon<(options)>`

Description: Produces a “contour plot,” actually a color intensity map, in the graphics window. The parameters `sp` and `wp`, `sp1` and `wp1`, and `sp2` and `wp2` control which portion of the spectrum is displayed. The parameters `sf` and `wf`, `sf1` and `wf1`, and `sf2` and `wf2` control which portion of time-domain data (FIDs and interferograms) is displayed. The parameter `trace` selects which dimension is displayed along the horizontal axis. The parameters `sc`, `wc`, `sc2`, and `wc2` control where on the screen the display occurs. The parameter `th` is

active as a threshold to black out all contours whose intensity is below th. That is, if th=7, the colors 1 to 6 are not used for the display. The parameter vs controls the vertical scale of the spectrum.

dcon displays either absolute-value mode or phase-sensitive 2D data. In av mode, data are shown in 15 different colors (starting with black), with each color representing a factor of two in intensity (a single color is used on monochrome screens). In the ph mode, the normal display of colors ranges from –6 to +6, each representing a factor of two in intensity, with the color black representing intensity 0 in the center.

Arguments: options can be any of the following:

- 'linear' is a keyword to use linear instead of logarithmic increments.
- 'phcolor' is a keyword to use a phased color set with positive and negative peaks.
- 'avcolor' is a keyword to use an absolute-value color set with positive peaks. Negative contours only *cannot* be displayed, but if the data can be rephased, 180° added to rp1, and dcon('avcolor') entered again, the same thing is accomplished by inverting the phase of all peaks. Alternatively, dpcon can display negative peaks only.
- 'gray' is a keyword to use a gray scale color set.
- 'noaxis' is a keyword to omit the display outline and any horizontal or vertical axis.
- 'plot' causes the dcon display to be sent to the plotter instead of being drawn on the graphics window.

Examples:
```
dcon
dcon('gray')
dcon('linear','phcolor','plot')
```

See also: *NMR Spectroscopy User Guide*

Related:

dconi	Interactive 2D data display (C)
dconi	Control display selection for the dconi program (P)
dconn	Display color intensity map without screen erase (C)
dpcon	Display plotted contours (C)
imageprint	Plot noninteractive gray scale image (M)
sc	Start of chart (P)
sc2	Start of chart in second direction (P)
sf	Start of FID (P)
sp	Start of plot (P)
sp1	Start of plot in 1st indirectly detected dimension (P)
sp2	Start of plot in 2nd indirectly detected dimension (P)
th	Threshold (P)
trace	Mode for *n*-dimensional data display (P)
wc	Width of chart (P)
wc2	Width of chart in second direction (P)
wf	Width of FID (P)
wp	Width of plot (P)
wp1	Width of plot in 1st indirectly detected dimension (P)
wp2	Width of plot in 2nd indirectly detected dimension (P)

dconi — Interactive 2D data display (C)

Syntax: dconi<(options)>

Description: Opens a 2D data display that can be interactively adjusted. The dconi program can accommodate any data set that can be displayed by dcon, dpcon, and

ds2d, including 2D FIDs, interferograms, 2D spectra, planes from 3D data sets, and images. These data sets are generated by the commands df2d, ft1d, ft2d, and ft3d.

Arguments: options can be any of the following (note that the dconi parameter is also available to control the dconi program display):

- 'dcon' is a keyword to display a color intensity map; this is the default mode, but 'dcon' is provided for compatibility with certain macros. If 'dcon' is the first argument, it can be followed by any of the keywords 'linear', 'phcolor', 'avcolor', 'gray', and 'noaxis'; all of these keywords have the same meaning as when used with dcon.
- 'dpcon' is a keyword to display a true contour plot. If 'dpcon' is the first argument, it can be followed by any of the keywords 'pos', 'neg', and 'noaxis', and then followed by values for levels and spacing. All of these options have the same meaning as when used with dpcon.
- 'ds2d' is a keyword to display a stacked plot in whitewash mode (after the first spectra, each spectra is blanked out in regions in which it is behind an earlier spectra). If 'ds2d' is the first argument, it can be followed by any of the keywords 'nobase', 'fill', 'fillnb', and 'noaxis'. All of these keywords have the same meaning as used with ds2d.
- 'again' is a keyword to make dconi identify which display mode is currently being used and redraw the screen in that mode.
- 'restart' is a keyword to activate dconi without redrawing the 2D data set. This action causes dconi to make sure that 2D data is already displayed.
- 'toggle' is a keyword to toggle between the cursor and box modes.
- 'trace' is a keyword to draw a trace above the spectrum.
- 'expand' is a keyword to toggle between the expand and full views of the spectrum.
- 'plot' is a keyword to plot a projection or a trace.
- 'hproj_max' is a keyword to do a horizontal projection of the maximum trace.
- 'hproj_sum' is a keyword to do a horizontal projection of the sum of all traces.
- 'vproj_max' is a keyword to do a vertical projection of the maximum trace.
- 'vproj_sum' is a keyword to do a vertical projection of the sum of all traces.

Examples:

```
dconi
dconi('dcon','gray','linear')
dconi('dpcon')
```

See also: *NMR Spectroscopy User Guide*

Related:

boxes	Draw boxes selected by the mark command (C)
crmode	Current state of cursors in dfid, ds, or dconi (P)
dcon	Display noninteractive color intensity map (C)
dconi	Control display selection for the dconi program (P)
dconn	Display color intensity map without screen erase (C)
delta1	Cursor difference in 1st indirectly detected dimension (P)
df2d	Display FIDs of 2D experiment (C)
dpcon	Display plotted contours (C)
ds2d	Display 2D spectra in whitewash mode (C)

ft1d	Fourier transform along f_2 dimension (C)
ft2d	Fourier transform 2D data (C)
ft3d	Perform a 3D Fourier transform on a 3D FID data set (M,U)
imconi	Display 2D data in interactive gray-scale mode (M)
is	Integral scale (P)
ll2d	Automatic and interactive 2D peak picking (C)
proj	Project 2D data (C)
sf	Start of FID (P)
sp	Start of plot (P)
sp1	Start of plot in 1st indirectly detected dimension (P)
th	Threshold (P)
vs2d	Vertical scale for 2D displays (P)
vsadj	Automatic vertical scale adjustment (M)
wf	Width of FID (P)
wp	Width of plot (P)
wp1	Width of plot in 1st indirectly detected dimension (P)

dconi — Control display selection for the dconi program (P)

Description: Controls the selection of the 2D display that follows entering the dconi command. Because dconi is implicitly executed by ft2d, the dconi parameter also controls the display that follows the ft2d or wft2d command.

dconi can be a string parameter in the "current" parameter set. Its syntax is similar to an argument string passed to the dconi program. For example, if dconi ='dpcon,pos,12,1.2', the dconi command displays twelve positive contours with dpcon, using a spacing of 1.2. The first component of the dconi string must be the name of the display program, such as dcon, dconn, dpcon, dpconn, ds2d, or ds2dn. Subsequent components of the string are arguments appropriate for that display program. Because the entire dconi parameter is a string, single quotes around words are not necessary and mixing words and numbers is not a problem, as the example above shows.

If the dconi parameter does not exist or is set to the null string (''), the dconi program uses its normal default. If the dconi parameter is set to a string (e.g., dconi='dcon,gray,linear' for image display), and arguments are supplied to the dconi program, (e.g., dconi('dpcon')), the supplied arguments to the command take precedence. In the case of the examples above, a contour map, not an image, is displayed.

If the dconi parameter does not exist in the current experiment, it can be created by the commands create('dconi','string') setgroup('dconi','display')

Values: '' (two single quotes) indicates that this parameter is ignored.

String 'display_program' selects the named program for 2D displays.

String 'display_program,option1,option2' selects the named program for 2D displays with options appropriate to the program.

Examples: dconi='dpcon' selects contour drawing rather than default color map
dconi='dcon,gray,linear' selects image display mode.

See also: *NMR Spectroscopy User Guide; VnmrJ Imaging NMR*

Related:

dcon	Display noninteractive color intensity map (C)
dconi	Interactive 2D data display (C)
dconn	Display color intensity map without screen erase (C)
dpcon	Display plotted contours (C)
dpconn	Display plotted contours without screen erase (C)
ds2d	Display 2D spectra in whitewash mode (C)
ds2dn	Display 2D spectra in whitewash mode without screen erase (C)

ft2d	Fourier transform 2D data (C)
imconi	Display 2D data in interactive gray-scale mode (M)
wft2d	Weight and Fourier transform 2D data (C)

dconn — Display color intensity map without screen erase (C)

Syntax: `dconn<(options)>`

Description: Produces a "contour plot," actually a color intensity map, on the screen the same as the `dcon` command, but without erasing the screen before starting the plot. The options available are the same as the `dcon` command.

See also: *NMR Spectroscopy User Guide*

Related:

dcon	Display noninteractive color intensity map (C)
dconi	Control display selection for the dconi program (P)

dcrmv — Remove dc offsets from FIDs in special cases (P)

Description: If `dcrmv` exists and is set to `'y'`, hardware information is used to remove the dc offset from the FID providing `ct=1`. This only works on systems with `sw` less than 100 kHz. If this feature is desired for a particular experiment, create `dcrmv` in that experiment by entering `create('dcrmv','string')` `setgroup('dcrmv','processing')` `dcrmv='y'`

To create image parameters `dcrmv`, `grayctr` and `graysl` in the current experiment, enter `addpar('image')`.

See also: *NMR Spectroscopy User Guide; VnmrJ Imaging NMR*

Related:

addpar	Add selected parameters to the current experiment (M)
create	Create new parameter in a parameter tree (C)
ct	Completed transients (P)
dc	Calculate spectral drift correction (C)
setgroup	Set group of a variable in a tree (C)

ddf — Display data file in current experiment (C)

Syntax: `ddf<(block_number,trace_number,first_number)>`

Description: Displays the file header of the data file in the current experiment. If entered with arguments, it also displays a block header and part of the data file of that block.

Arguments: `block_number` is the block number. Default is 1.

`trace_number` is the trace number within the block. Default is 1.

`first_number` is the first data element number within the trace. Default is 1.

See also: *User Programming*

Related:

ddff	Display FID file in current experiment (C)
ddfp	Display phase file in current experiment (C)

ddff — Display FID file in current experiment (C)

Syntax: `ddff<(block_number,trace_number,first_number)>`

Description: Displays the file header of the FID file in the current experiment. If entered with arguments, it also displays a block header and part of the FID data of the block.

Arguments: `block_number` is the block number. Default is 1.

`trace_number` is the trace number within the block. Default is 1.

`first_number` is the first data element number within the trace. Default is 1.

See also: *User Programming*

Related:
- ddf — Display data file in current experiment (C)
- ddfp — Display phase file in current experiment (C)

ddfp — Display phase file in current experiment (C)

Syntax: `ddfp<(block_number,trace_number,first_number)>`

Description: Displays the file header of the phase file in the current experiment. With arguments, it also display a block header and part of the phase file data of that block.

Arguments: `block_number` is the block number. Default is 1.

`trace_number` is the trace number within the block. Default is 1.

`first_number` is the first data element number within the trace. Default is 1.

See also: *User Programming*

Related:
- ddf — Display data file in current experiment (C)
- ddff — Display FID file in current experiment (C)

ddif — Synthesize and show DOSY plot (C)

Syntax: `ddif(<option>,lowerlimit,upperlimit)`

Description: Synthesizes a 2D spectrum from 1D spectra using the information produced by the dosy macro. `ddif` takes the 1D spectrum and a table of diffusion data stored in the file diffusion_display.inp in the current experiment and synthesizes a 2D DOSY spectrum. It is normally run by `dosy`, but can be directly run, for example, to recalculate a 2D DOSY spectrum with different digitization.

Arguments: `option` is either `'i'` or `'c'`.

`'i'` is for a display in which the 2D peak volume is proportional to 1D peak height.

`'c'` is for a display in which the 2D peak height equals the 1D.

`lowerlimit` is the lower diffusion limit (in units of 10^{-10} m^2/s).

`upperlimit` is the upper diffusion limit (in units of 10^{-10} m^2/s).

If arguments are not supplied, `ddif` defaults to showing the full range of diffusion coefficients in the file diffusion_display.inp in the current experiment. Make sure that the first increment of the DOSY data set has been transformed with the desired `fn2D` before using `ddif`. Digitization of the resultant spectrum is determined by `fn2D` in the spectral (F2) domain and `fn1` in the diffusion (F1) domain. Make sure that the product `fn2D*fn1` is not too large, or memory and processing time problems might result. Typical values are `fn2D=16384` (max: 64k) and `fn1=512`. After `dosy` or `ddif`, 1D data is overwritten by the 2D (the `dosy` macro keeps a copy of the 1D data, which can be retrieved with the command `undosy`). Similarly, after a DOSY spectrum has been calculated, it can be retrieved with the command `redosy`.

See also: *NMR Spectroscopy User Guide*

Related:
- dosy — Process DOSY experiments (M)
- fn2D — Fourier number to build up 2D DOSY display in frequency domain (P)
- redosy — Restore the previous 2D DOSY display from the subexperiment (M)
- undosy — Restore original 1D NMR data from the subexperiment (M)

ddrcr — Direct digital receiver coefficient ratio (P)

Applicability: VNMRS systems and 400 - MR systems

Syntax: `ddrcr=<value>`

Description: Sets the filter sharpness or filter coefficient ratio. The default value of 75 is used if the parameter does not exist.

Examples:
```
create('ddrce','integer')
setlimit('ddrcr',1000,2,1)
ddrcr=300
```

Values: Integer values between 2 and 1000

See also: *NMR Spectroscopy User Guide* and *VnmrJ User Programming*.

Related:

`sw`	Spectral width in directly detected dimension (P)

ddrpm — Set ddr precession mode (P)

Applicability: VNMRS systems

Syntax: `ddrpm=<'mode'>`

Values: `mode` can be either of following:

Mode	*Description*
`p`	Pulse — default if no argument is supplied. The value is calculated as follows if `ddrpm` does not exist or `ddrpm='p'`: `ddrtc = alfa + rof2 + 2 * pw[1] / π`
`e`	Echo — The value is calculated as follows: `ddrtc = alfa`.

See also: *VnmrJ User Programming*

Related:

`setrc`	Set frequency referencing based upon lock signal shift (M)
`ddrtc`	Set ddr precession mode (P)

ddrtc — Set ddr time constant (P)

Applicability: VNMRS systems

Syntax: `ddrtc=<'value'>`

Description: The value of `ddrtc` is set in the `setrc` macro and is determined by the `ddrpm` parameter.

A value of `ddrtc = alfa` is used by `psg` if the `ddrtc` parameter does not exist.

Values: `value 0 to 1000` µsec.

See also: *VnmrJ User Programming*

Related:

`setrc`	Set frequency referencing based upon lock signal shift (M)
`setlp0`	Set parameters for zero linear phase (M)
`ddrpm`	Set ddr precession mode (P)

dds — Default display (M)

Description: Looks for sequence-specific default display macro (`dds_seqfil`) and executes if one is found. If not, the `dds` macro displays 1D, 2D, or array spectrum as the case may be.

Related:

`dds_seqfil`	Sequence-specific default display (M)
`dpl`	Default plot (M)
`dpr`	Default process (M)

dds_*seqfil* Sequence-specific default display (M)

Description: Sequence-specific default display. These macros are called by the `dds` macro.

Examples:
```
dds_NOESY1D
dds_TOCSY1D
```

Related:

`dds`	Default display (M)
`dpl`	Default plot (M)
`dpr`	Default process (M)

debug Trace order of macro and command execution (C)

Syntax: `debug('c'|'C')`

Description: Controls VnmrJ command and macro tracing. When turned on, `debug` displays a list of each command and macro in the shell tool from which VnmrJ was started. If VnmrJ is started when the user logs in, or if it was started from a drop-down menu or the CDE tool, the output goes to a Console window. If no Console window is present, the output goes into a file in the `/var/tmp` directory. This last option is not recommended. Nesting of the calls is indicated by indentation of the output. This feature is primarily a debugging tool for MAGICAL programming.

To associate the debut('c') output with a particular terminal, enter `tty`. The system responds with `/dev/pts/`*yyy*, where *yyy* is a numerical value. On the VnmrJ command line, enter `jFunc(55, '/dev/pts/`*yyy*`')`, substituting the numerical value for the *yyy*.

Arguments: `'c'` is a keyword to turn on command and macro tracing.

`'C'` is a keyword to turn off command and macro tracing.

Examples:
```
debug('c')
debug('C')
```

See also: *User Programming*

decasynctype Select the type of decoupler asynchronous mode (P)

Applicability: VNMR systems, 400 MR

Syntax: `decasynctype=<value>`

Description: Optional parameter to select the type of decoupler asynchronous mode. The default type is `p` (progressive mode), which simulates a free running decoupler with respect to the pulse sequence timing. The other available options are `b` (bit reversed mode) and `r` (random mode). The `b` mode (bit-reversed mode) may be especially appropriate for reducing unwanted decoupling side-band intensity, when the number of transients is small. In the `r` mode (random mode) the starting decoupling stage is randomized. The `decasynctype` setting affects the decoupling on all the rf channels (`dm`, `dm2`, `dm3` etc.). This parameter is optional and if it does not exist the decoupler asynchronous mode is set to `p` (progressive mode).

Values: `'p'` — progressive mode, mode used by Inova systems

`'b'` — bit-reversed mode

`'r'` — random mode

Examples: `decasynctype='p'` for progressive mode.

Related:

`dm`	Decoupler mode for first decoupler (P)

dm2	Decoupler mode for second decoupler (P)
dm3	Decoupler mode for third decoupler (P)

deccwarnings — Control reporting of DECC warnings from PSG (P)

Applicability: Systems with DECC (Digital Eddy Current Compensation) boards for gradient compensation.

Description: A global parameter that controls whether PSG will warn the user when the ECC corrections are large enough that they could exceed the capabilities of the DECC board. By default, this parameter does not exist, and a warning is printed whenever an experiment is started if the ECC amplitudes are possibly too large. The warning does indicate a definite be a problem, only that not enough ECC drive capability is available to compensate for an instantaneous gradient swing from minus the maximum gradient strength to the maximum positive gradient.

To disable the warnings, create this global string parameter and set it to 'n'.

Values: 'n' or 'N' to suppress warnings. If the value starts with any other character, the normal warnings are printed.

decomp — Decompose a VXR-style directory (M)

Syntax: `decomp<(VXR_file)>`

Description: Takes a library, as loaded from a VXR-style system (VXR, XL, or Gemini), and extracts each entry into a separate UNIX file. The file can be obtained from a magnetic tape or over limNET. `decomp` creates a UNIX subdirectory in the current working directory and uses that to write each entry as a UNIX file. The name of the UNIX subdirectory is derived from the library name.

Arguments: `VXR_file` is the name of the original file. It must have an extension in the form .`NNN`, where `NNN` is the number of entries in the original library. A limit of 432 entries is imposed.

See also: *NMR Spectroscopy User Guide*

Related:

convert	Convert data set from a VXR-style system (C,U)

def_osfilt — Default value of osfilt parameter (P)

Description: A global parameter that establishes the default type of digital filter, Analog*Plus*™ or brickwall, when DSP is configured. The *actual* filter used in any experiment is set by the local parameter `osfilt`. Usually, `def_osfilt` is set to the value for normal use, and then `osfilt` is changed within a given experiment if different filter characteristics are desired.

Values: `'a'` or `'A'` for the Analog*Plus* digital filter. This filter is flatter in the passband and drops off somewhat more sharply than analog filters.

`'b'` or `'B'` for the brickwall digital filter. This filter is extremely flat across the passband and drops off sharply on the edge; however, the enhanced filtering comes at the expense of somewhat reduced baseline performance.

See also: *NMR Spectroscopy User Guide*

Related:

dsp	Type of DSP for data acquisition (P)
osfilt	Oversampling filter for real-time DSP (P)

defaultdir — Default directory for Files menu system (P)

Description: Stores the name to the default directory for use with the Directory Menu in the Files menu system. Initial value for `defaultdir` is the home or login

directory of the user. Selecting the Default button in the Directory Menu sets the current directory to the value of `defaultdir`. The opposite action, setting the value of `defaultdir` to the current directory, occurs when the Set Default button in the Directory Menu is selected. If the entry for a directory is marked and the Set Default button is selected, the directory marked becomes the new value of `defaultdir`.

See also: *NMR Spectroscopy User Guide*

delcom — Delete a user macro (M)

Syntax: `delcom(file)`

Description: Deletes a macro file in a user's macro library *(*`maclib`). Note that `delcom` will not delete a macro in the VnmrJ system macro library.

Arguments: `file` is the file name of the user's macro to be deleted.

Examples: `delcom('lds')`

See also: *User Programming*

Related:

`crcom`	Create user macro without using a text editor (C)
`macrorm`	Remove a user macro (C)

delete — Delete a file, parameter directory, or FID directory (C)

Syntax: `delete(file1<,file2,...>)`

Description: Delete files and directories in a somewhat safer manner than the `rm` command. Using `rm` is not recommended in VnmrJ because `rm` allows wildcard characters (`*` and `?`) in the file description and recursive file deletion with the `-r` option. The `delete` command does not allow wildcard characters or the `-r` option, but you can still use the `delete` command to delete a file as well as remove `.fid` and `.par` directories, normally the only directories that need to be removed (experiment directories are deleted with the `delexp` macro).

Arguments: `file1, file2, ...` are the names of one or more files or directories to be deleted. When the `delete` command is entered, it first searches for `file1`. If it finds that file and it is not a directory, `file1` is deleted. If `file1` is not found, `.fid` is appended to the file name and `delete` searches for the file in that `.fid` directory. If the file is found, it is removed; otherwise, `.par` is appended to the file name and `delete` searches for the file in that `.par` directory. If the file is found, it is removed; otherwise, the command takes no action and continues to the next file name. The process is repeated for each file name given as an argument.

Examples:

```
delete('/home/vnmr1/memo')
delete('/vnmr/fidlib/fid1d')
```

See also: *NMR Spectroscopy User Guide*

Related:

`delexp`	Delete an experiment (M)
`rm`	Delete file (C)
`rmdir`	Remove directory (C)

delexp — Delete an experiment (M)

Syntax: `delexp(experiment_number)`

Description: Deletes an experiment.

Arguments: `experiment_number` is the number (from 2 through 9999) of the experiment to be deleted (experiment 1 cannot be deleted). `delexp` also deletes the corresponding `jexp`XXX macro if necessary.

Examples:
```
delexp(321)
```

See also: *NMR Spectroscopy User Guide*

Related:

`cexp`	Create an experiment (M)
`jexp`	Join existing experiment (C)

`deletenucleus` Removes nucleus entry from current probe file (M)

Applicability: ALL

Description: All lines for the specified nucleus are removed from the current probe file. The argument should correspond to an entry in the probe file.

Syntax:
```
deletenucleus('nucleus')
```

Arguments: `nucleus` — name followed by atomic number, e.g. C13 not 13C.

Examples:
```
deletenucleus('Si29')
```

Related:

`addnucleus`	Adds nucleus entry to probe file (M)
`addprobe`	Create new probe directory and probe file (M)

`dels` Delete spectra from T_1 or T_2 analysis (C)

Syntax:
```
dels(index1<,index2,...>)
```

Description: Deletes the spectra selected from the file `fp.out` (the output file of `fp`) used by the `t1` or `t2` analysis. Spectra may be restored by rerunning `fp`.

Arguments: `index1,index2,...` are the indexes of the spectra to be deleted.

Examples:
```
dels(7)
dels(2,5)
```

See also: *NMR Spectroscopy User Guide*

Related:

`dll`	Display listed line frequencies and intensities (C)
`fp`	Find peak heights or phases (C)
`getll`	Get frequency and intensity of a line (C)
`t1`	T_1 exponential analysis (M)
`t2`	T_2 exponential analysis (M)

`delta` Cursor difference in directly detected dimension (P)

Description: Difference between two frequency cursors along the directly detected dimension. The value is changed by moving the right cursor, relative to the left, in the `ds` or `dconi` display.

Values: Positive number, in Hz.

See also: *NMR Spectroscopy User Guide*

Related:

`dconi`	Interactive 2D data display (C)
`delta1`	Cursor difference in 1st indirectly detected dimension (P)
`delta2`	Cursor difference in 2nd indirectly detected dimension (P)
`ds`	Display a spectrum (C)
`split`	Split difference between two cursors (M)

delta1 — Cursor difference in 1st indirectly detected dimension (P)

Description: Difference of two frequency cursors along the first indirectly detected dimension. Analogous to the delta parameter except that delta1 applies to the first indirectly detected dimension of a multidimensional data set.

Values: Positive number, in Hz.

See also: *NMR Spectroscopy User Guide*

Related:

delta	Cursor difference in directly detected dimension (P)

delta2 — Cursor difference in 2nd indirectly detected dimension (P)

Description: Difference of two frequency cursors along the second indirectly detected dimension. Analogous to the delta parameter except that delta2 applies to the second indirectly detected dimension of a multidimensional data set.

Values: Positive number, in Hz.

See also: *NMR Spectroscopy User Guide*

Related:

delta	Cursor difference in directly detected dimension (P)

deltaf — Difference of two time-domain cursors (P)

Description: Difference between the two time-domain cursors of the df (or dfid) display. To create this parameter and the other FID display parameters axisf, dotflag, vpf, vpfi, and crf (if the parameter set is older and lacks these parameters), enter addpar('fid').

Values: Number, in seconds.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
crf	Current time-domain cursor position (P)
df	Display a single FID (C)
dfid	Display a single FID (C)

Dept — Set up parameters for DEPT experiment (M)

Description: Set up parameters for DEPT experiment

See also: *NMR Spectroscopy User Guide*

Related:

adept	Automatic DEPT analysis and spectrum editing (C)
autodept	Automated complete analysis of DEPT data (M)
deptgl	Set up parameters for DEPTGL pulse sequence (M)
deptproc	Process array of DEPT spectra (M)
padept	Plot automatic DEPT analysis (C)
ppcal	Proton decoupler pulse calibration (M)

deptgl — Set up parameters for DEPTGL pulse sequence (M)

Description: Macro for the DEPTGL pulse sequence for spectral editing and polarization transfer experiments.

See also: *NMR Spectroscopy User Guide*

Related:

Dept	Set up parameters for DEPT pulse sequence (M)

D

deptproc — Process array of DEPT spectra (M)

Description: Automatically processes arrays of DEPT-type spectra. The FIDs are transformed (using `lb=2.5`), phased, and scaled. In foreground operation, a stacked display is produced. By default, an automatic DEPT analysis (`adept`) is performed.

See also: *NMR Spectroscopy User Guide*

Related:

`adept`	Automatically edit DEPT spectra (C)
`Dept`	Set up parameters for DEPT experiment
`lb`	Line broadening along the directly detected dimension (P)
`pldept`	Plot DEPT type spectra (M)
`procplot`	Automatically process FIDs (M)

destroy — Destroy a parameter (C)

Syntax: `destroy(parameter<,tree>)`

Description: Removes a parameter from one of the parameter trees. If the destroyed parameter was an array, the `array` parameter is automatically updated.

If destroy is called for a non-existent parameter, the command will abort with a message. If an optional return value is given, it will indicate success (1) or failure (0) and the command will not abort.

Arguments: `parameter` is the name of the parameter to be destroyed.

`tree` is a keyword for the type of parameter tree: `'global'`, `'current'`, `'processed'`, or `'systemglobal'`. The default is `'current'`. Refer to the `create` command for more information on types of trees.

Examples:

```
destroy('a')
destroy('c','global')
```

See also: *User Programming*

Related:

`array`	Parameter order and precedence (P)
`create`	Create new parameter in a parameter tree (C)
`display`	Display parameters and their attributes (C)
`paramvi`	Edit a variable and its attributes using `vi` text editor (C)
`prune`	Prune extra parameters from current tree (C)

destroygroup — Destroy parameters of a group in a tree (C)

Syntax: `destroygroup(group<,tree>)`

Description: Removes parameters of a group from one of the parameters trees.

Arguments: `group` is a keyword for the type of parameter group: `'all'`, `'sample'`, `'acquisition'`, `'processing'`, `'display'`, or `'spin'`.

`tree` is a keyword for the type of parameter tree: `'global'`, `'current'`, or `'processed'`. The default is `'current'`. Refer to the `create` command for more information on trees.

Examples:

```
destroygroup('sample')
destroygroup('all','global')
```

See also: *User Programming*

Related:

`create`	Create new parameter in a parameter tree (C)
`destroy`	Destroy a parameter (C)
`display`	Display parameters and their attributes (C)
`groupcopy`	Copy parameters of group from one tree to another (C)
`setgroup`	Set group of a variable in a tree (C)

df — Display a single FID (C)

Syntax: (1) `df<(index)>`
(2) `df(options)`

Description: Displays a single FID. Parameter entry after an FID has been displayed causes the display to be updated. The FID is left-shifted by the number of complex data points specified by the parameter `lsfid`. The FID is also phase-rotated (zero-order only) by the number of degrees specified by the parameter `phfid`. Left shifting and phasing can be avoided by setting `lsfid` and `phfid` to `'n'`. `df` is identical in function to the `dfid` command.

Arguments: `index` (used with syntax 1) is the number of a particular FID for arrayed 1D experiments or for 2D experiments. Default is 1.

`options` (used with syntax 2) is any of the following:

- `'toggle'` is a keyword to switch between box and cursor modes.
- `'restart'` is a keyword to redraw the cursor if it has been turned off.
- `'expand'` is a keyword to switch between expanded and full views of the FID.
- `'imaginary'` is a keyword to switch on and off the display of the imaginary FID.
- `'sfwf'` is a keyword to interactively adjust the start and width of the FID display.
- `'phase'` is a keyword to enter an interactive phasing mode.
- `'dscale'` is a keyword to toggle the scale below the FID on and off.

Examples:
```
df
df(4)
df('restart')
```

See also: *NMR Spectroscopy User Guide*

Related:

`crmode`	Current state of cursors in `dfid`, `ds`, or `dconi` (P)
`dfid`	Display a single FID (C)
`df2d`	Display FIDs of 2D experiment (C)
`dfmode`	Current state of display of imaginary part of a FID (P)
`lsfid`	Number of complex points to left-shift the `np` FID (P)
`phfid`	Zero-order phasing constant for the `np` FID (P)

df2d — Display FIDs of 2D experiment (C)

Syntax: `df2d<(<'nf',><array_index>)>`

Description: Produces a color intensity map of the raw 2D FIDs as a function of t_1 and t_2. The display can be modified by subsequent display commands, for example, `df2d dconn` will display the 2D FIDs without clearing the graphics screen.

Arguments: `'nf'` is a keyword specifying that the data has been collected in the compressed form using `nf`. In other words, each array element is collected as one 2D FID or image comprised of `nf` FIDs or traces.

`array_index` is the index of the array to be displayed.

Examples:
```
df2d
df2d(1)
```

See also: *NMR Spectroscopy User Guide*

Related:

`dconi`	Interactive 2D data display (C)
`df`	Display a single FID (C)

D

dfid — Display a single FID (C)

Syntax: (1) `dfid<(index)>`
(2) `dfid<(options)>`

Description: Functions the same as the `df` command. See `df` for information.

See also: *NMR Spectroscopy User Guide*

Related:

`df`	Display a single FID (C)

dfmode — Current state of display of imaginary part of a FID (P)

Description: Holds a string variable that reflects the state of display of the imaginary part of a FID. `dfmode` is primarily used by the programmable menu `dfid` to determine the status of the display of the imaginary part of a FID.

Values: `'r'` indicates the current display is real only.

`'i'` indicates the current display is imaginary.

`'z'` indicates the display is zero imaginary.

See also: *User Programming*

dfrq — Transmitter frequency of first decoupler (P)

Description: Contains the transmitter frequency for the first decoupler. `dfrq` is automatically set when the parameter `dn` is changed and should not be necessary for the user to manually set.

Values: Frequency, in MHz. The value is limited by synthesizer used with the channel.

See also: *NMR Spectroscopy User Guide*

Related:

`dfrq2`	Transmitter frequency of second decoupler (P)
`dfrq3`	Transmitter frequency of third decoupler (P)
`dfrq4`	Transmitter frequency of fourth decoupler (P)
`dn`	Nucleus for first decoupler (P)
`dof`	Frequency offset for first decoupler (P)
`sfrq`	Transmitter frequency of observe nucleus (P)
`spcfrq`	Display frequencies of rf channels (M)

dfrq2 — Transmitter frequency of second decoupler (P)

Applicability: Systems with a second decoupler.

Description: Contains the transmitter frequency for the second decoupler. `dfrq2` is automatically set when parameter `dn2` is changed and should not be necessary for the user to manually set.

Values: Frequency, in MHz. Value is limited by synthesizer used with the channel. If `dn2=''` (two single quotes with no space in between) and a second decoupler is present in the console, `dfrq2` is internally set to 1 MHz.

See also: *NMR Spectroscopy User Guide*

Related:

`dn2`	Nucleus for second decoupler (P)
`dof2`	Frequency offset for second decoupler (P)

dfrq3 — Transmitter frequency of third decoupler (P)

Applicability: Systems with a third decoupler.

Description: Contains the transmitter frequency for the third decoupler. dfrq3 is automatically set when the parameter dn3 is changed and should not be necessary for the user to manually set.

Values: Frequency, in MHz. Value is limited by synthesizer used with the channel. If dn3='' (two single quotes with no space in between) and a third decoupler is present in the console, dfrq3 is internally set to 1 MHz.

See also: *NMR Spectroscopy User Guide*

Related:

dn3	Nucleus for third decoupler (P)
dof3	Frequency offset for third decoupler (P)

dfrq4 Transmitter frequency of fourth decoupler (P)

Applicability: Systems with a deuterium decoupler channel as the fourth decoupler.

Description: Contains the transmitter frequency for the fourth decoupler. dfrq4 is automatically set when the parameter dn4 is changed and should not be necessary for the user to manually set.

Values: Frequency, in MHz. Value is limited by a synthesizer used with the channel. If dn4='' (two single quotes with no space in between) and a fourth decoupler is present in the console, dfrq4 is internally set to 1 MHz.

See also: *NMR Spectroscopy User Guide*

Related:

dn4	Nucleus for fourth decoupler (P)
dof4	Frequency offset for fourth decoupler (P)
spcfrq	Display frequencies of rf channels (M)
rftype	type of rf generation

dfs Display stacked FIDs (C)

Syntax: dfs<(<start><,finish><,step><,'all'|'imag'><,color>)>

Description: Displays one or more FIDs. The position of the first FIDs is governed by the parameters wc, sc, and vpf. A subsequent FID is positioned relative to the preceding FID by the parameters vo and ho.

Arguments: start is the index number of the first FID for multiple FIDs. It can also be the index number of a particular FID for arrayed 1D or 2D data sets.

finish is the index number of the last FID for multiple FIDs. To include all FIDs, set start to 1 and finish to arraydim (see example below).

step is the increment for the FID index. The default is 1.

'all' is a keyword to display all of the FIDs. This is the default.

'imag' is a keyword to display only the imaginary FID channel.

color is the color of the display: 'red', 'green', 'blue', 'cyan', 'magenta','yellow', 'black', or 'white'.

Examples:

```
dfs(1,arraydim,3)
dfs('imag')
```

See also: *NMR Spectroscopy User Guide*

Related:

arraydim	Dimension of experiment (P)
dfsa	Display stacked FIDs automatically (C)
dfsan	Display stacked FIDs automatically without screen erase (C)
dfsh	Display stacked FIDs horizontally (C)
dfshn	Display stacked FIDs horizontally without screen erase (C)
dfsn	Display stacked FIDs without screen erase (C)
dfww	Display FIDs in whitewash mode (C)

ho	Horizontal offset (P)
plfid	Plot FID (C)
pfww	Plot FIDs in whitewash mode (C)
sc	Start of chart (P)
vo	Vertical offset (P)
vpf	Current vertical position of FID (P)
wc	Width of chart (P)

dfsa — Display stacked FIDs automatically (C)

Syntax: `dfsa<(<start><,finish><,step><,'all'|'imag'><,color>)>`

Description: Displays one or more FIDs automatically by adjusting the parameters vo and ho to fill the screen in a lower left to upper right presentation (wc must be set to less than full screen width for this to work). The position of the first FID is governed by parameters wc, sc, and vpf.

Arguments: `start` is the index number of the first FID for multiple FIDs. It can also be the index number of a particular FID for arrayed 1D or 2D data sets.

`finish` is the index number of the last FID for multiple FIDs.

`step` is the increment for the FID index. The default is 1.

`'all'` is a keyword to display all of the FIDs. This is the default.

`'imag'` is a keyword to display only the imaginary FID channel.

`color` is the color of the display: `'red'`, `'green'`, `'blue'`, `'cyan'`, `'magenta'`, `'yellow'`, `'black'`, or `'white'`.

See also: *NMR Spectroscopy User Guide*

Related:

dfs	Display stacked FIDs (C)
dfsan	Display stacked FIDs automatically without screen erase (C)

dfsan — Display stacked FIDs automatically without screen erase (C)

Syntax: `dfsan<(<start><,finish><,step><,'all'|'imag'><,color>)>`

Description: Functions the same as the command dfsa except the graphics window is not erased before starting the display. This allows composite displays of many FIDs to be created. The arguments are the same as dfsa.

See also: *NMR Spectroscopy User Guide*

Related:

dfsa	Display stacked FIDs automatically (C)

dfsh — Display stacked FIDs horizontally (C)

Syntax: `dfsh<(<start><,finish><,step><,'all'|'imag'><,color>)>`

Description: Displays one or more FIDs horizontally by setting vo to zero and adjusting ho, sc, and wc to fill the screen from left to right with the entire array. The position of the first FID is governed by parameters wc, sc, and vpf.

Arguments: `start` is the index number of the first FID for multiple FIDs. It can also be the index number of a particular FID for arrayed 1D or 2D data sets.

`finish` is the index number of the last FID for multiple FIDs. To display all FIDs, set `finish` to the parameter `arraydim`.

`step` is the increment for the FID index. The default is 1.

`'all'` is a keyword to display all of the FIDs. This is the default.

`'imag'` is a keyword to display only the imaginary FID channel.

color is the color of the display: 'red', 'green', 'blue', 'cyan', 'magenta', 'yellow', 'black', or 'white'.

See also: *NMR Spectroscopy User Guide*

Related:
- dfs — Display stacked FIDs (C)
- dfshn — Display stacked FIDs horizontally without screen erase (C)

dfshn — Display stacked FIDs horizontally without screen erase (C)

Syntax: dfshn<(<start><,finish><,step><,'all'|'imag'><,color>)>

Description: Functions the same as the command dfsh except the graphics window is not erased before starting the display. This allows composite displays of many FIDs to be created. The arguments are the same as dfsh.

See also: *NMR Spectroscopy User Guide*

Related:
- dfsh — Display stacked FIDs horizontally (C)

dfsn — Display stacked FIDs without screen erase (C)

Syntax: dfsn<(<start><,finish><,step><,'all'|'imag'><,color>)>

Description: Functions the same as the command dfs except the graphics window is not erased before starting the display. This allows composite displays of many FIDs to be created. The arguments are the same as dfs.

See also: *NMR Spectroscopy User Guide*

Related:
- dfs — Display stacked FIDs (C)

dfww — Display FIDs in whitewash mode (C)

Syntax: dfww<(<start><,finish><,step><,'all'|'imag'><,color>)>

Description: Displays FIDs in whitewash mode (after the first FID, each FID is blanked out in regions in which it is behind an earlier FID). The position of the first FIDs is governed by parameters wc, sc, and vpf.

Arguments:

start is the index number of the first FID for multiple FIDs. It can also be the index number of a particular FID for arrayed 1D or 2D data sets.

finish is the index number of the last FID for multiple FIDs.

step is the increment for the FID index. The default is 1.

'all' is a keyword to display all of the FIDs. This is the default.

'imag' is a keyword to display only the imaginary FID channel.

color is the color of the display: 'red', 'green', 'blue', 'cyan', 'magenta', 'yellow', 'black', or 'white'.

See also: *NMR Spectroscopy User Guide*

Related:
- dfs — Display stacked FIDs (C)
- pfww — Plot FIDs in whitewash mode (C)

dg — Display group of acquisition/processing parameters (C)

Syntax: dg('template',<'file_name'>)

Description: Displays the group of acquisition and 1D/2D processing parameters. To display an individual parameter, enter the name of the parameter followed by a question mark (e.g., sw?). Parameters do not have to be displayed in order to be entered or changed. The dg display is controlled by the string parameter dg.

Arguments: `template` is the name of the template parameter. The default is `'dg'`. See the manual *User Programming* for rules on constructing a template. The macros `dg` `dg1`, `dg2`, `dglp, and dgs` activate `dg` with a `template` argument such as `'dg'`,`'dg1'`, `'dg2'`, `'dglp'`, `'dgs'`, etc. or a user defined template.

`file_name` is the name of the file to which the `dg` command will write the parameters specified by `template`.

Examples:
```
dg
dg('dgexp')
dg('dg','dgout')
```

See also: *NMR Spectroscopy User Guide; User Programming*

Related:

`?`	Display the value of an individual parameter (C)
`da`	Display acquisition parameter arrays (C)
`dglp`	Display group of linear prediction parameters (C)
`da`	Display acquisition parameter arrays (P)
`dg`	Control `dg` parameter group display (P)
`dglp`	Control `dglp` parameter group of linear prediction parameters (P)
`dg1`	Display group of display parameters (M)
`dg2`	Display group of 3rd and 4th rf channel/3D parameters (M)
`dgs`	Display group of special/automation parameters (M)

`dg` — Control dg parameter group display (P)

Description: Controls the display of the `dg` command for the group of acquisition and 1D/2D processing parameters. `dg`, a string parameter, can be modified with the command `paramvi('dg')`.

See also: *NMR Spectroscopy User Guide*

Related:

`dg`	Display group of acquisition/processing parameters (C)
`paramvi`	Edit a parameter and its attributes with `vi` text editor (C)

`dg1` — Display group of display parameters (M)

Description: Displays the group of display parameters. To display an individual parameter, enter the name of the parameter followed by a question mark (e.g., `sp?`). Parameters do not have to be displayed in order to be entered or changed. The `dg1` display is controlled by the string parameter `dg1`.

See also: *NMR Spectroscopy User Guide*

Related:

`?`	Display individual parameter value (C)
`dg1`	Control `dg1` parameter group display (P)
`dg`	Display group of acquisition/processing parameters (C)

`dg1` — Control dg1 parameter group display (P)

Description: Controls the display of the `dg1` command for the group of display parameters. `dg1`, a string parameter, can be modified with `paramvi('dg1')`.

See also: *NMR Spectroscopy User Guide*

Related:

`dg1`	Display group of display parameters (M)
`paramvi`	Edit a parameter and its attributes with *vi* text editor (C)

`dg2` — Display group of 3rd and 4th rf channel/3D parameters (M)

Description: Displays the group of acquisition parameters associated with a second decoupler channel on a system with a third rf channel. It also displays the group

of parameters associated with selective 2D processing of 3D data sets. To display an individual parameter, enter the name of the parameter followed by a question mark (e.g., `sw?`). Parameters do not have to be displayed in order to be entered or changed. The `dg2` display is controlled by the string parameter `dg2`.

See also: *NMR Spectroscopy User Guide*

Related:

`dg`	Display group of acquisition/processing parameters (C)
`dg2`	Control `dg2` parameter group display (P)

`dg2` Control dg2 parameter group display (P)

Description: Controls the display of the `dg2` command for the group of 3rd and 4th rf channel/3D parameters. `dg2`, a string parameter, can be modified with the command `paramvi('dg2')`. To retrieve the `dg2` and `ap` display templates for the current experiment, enter `addpar('3rf')`.

See also: *NMR Spectroscopy User Guide*

Related:

`addpar`	Add selected parameters to the current experiment (M)
`dg2`	Display group of 3rd and 4th rf channel/3D parameters (M)
`paramvi`	Edit a parameter and its attributes with `vi` text editor (M)

`dga` Display group of spin simulation parameters (M)

Description: Displays the file of spin simulation parameters (Group A). There is one such group of parameters in the data system, not one per experiment as with normal NMR parameters.

See also: *NMR Spectroscopy User Guide*

Related:

`dg`	Display group of acquisition/processing parameters (C)
`dla`	Display spin simulation parameter arrays (C)

`DgcsteSL` Set up parameters for DgcsteSL pulse sequence (M)

Description: Converts a parameter set to DgcsteSL experiment.

See also: *NMR Spectroscopy User Guide*

Related:

`dosy`	Process DOSY experiments (M)
`fiddle`	Perform reference deconvolution (M)
`setup_dosy`	Set up gradient levels for DOSY experiments (M)

`Dgcstecosy` Set up parameters for Dgcstecosy pulse sequence (M)

Description: Converts a parameter set to Dgcstecosy experiment

See also: *NMR Spectroscopy User Guide*

Related:

`dosy`	Process DOSY experiments (M)
`makeslice`	Synthesize 2D projection of a 3D DOSY spectrum (C)
`setup_dosy`	Set up gradient levels for DOSY experiments (M)
`showoriginal`	Restore first 2D spectrum in 3D DOSY spectrum (M)

`Dgcstehmqc` Set up parameters for Dgcstehmqc pulse sequence (M)

Description: Converts a parameter set to Dgcstehmqc experiment

See also: *NMR Spectroscopy User Guide*

Related:

dosy	Process DOSY experiments (M)
makeslice	Synthesize 2D projection of 3D DOSY spectrum (C)
setup_dosy	Set up gradient levels for DOSY experiments (M)
showoriginal	Restore first 2D spectrum in 3D DOSY spectrum (M)

dglc — Display group of LC-NMR parameters (M)

Applicability: Systems with LC-NMR accessory.

Description: Displays parameters related to LC-NMR on a separate screen. This macro is equivalent to the command `dg('dglc')`.

See also: *NMR Spectroscopy User Guide*

Related:

dglc	Control LC-NMR parameter display (P)

dglc — Control dglc parameter group display (P)

Applicability: Systems with LC-NMR accessory.

Description: Controls the display of the LC-NMR parameters by the macro dglc and the equivalent command `dg('dglc')`. If this parameter does not exist, the parlc macro can create it.

See also: *NMR Spectroscopy User Guide*

Related:

dglc	Display LC-NMR parameters (M)
parlc	Create LC-NMR parameters (M)

dglp — Display group of linear prediction parameters (C)

Syntax: `dglp`

Description: Displays the linear prediction parameters group. Parameters do not have to be displayed in order to be entered or changed. The `dglp` display is controlled by the string parameter dglp.

Examples: `dglp`

See also: *NMR Spectroscopy User Guide; User Programming*

Related:

dg	Control dg parameter group display (P)

dgs — Display group of shims and automation parameters (M)

Description: Displays the group of shims and automation parameters. To display an individual parameter, enter name of the parameter followed by a question mark (e.g., `sw?`). Parameters do not have to be displayed in order to be entered or changed. The `dgs` display is controlled by the parameter dgs.

See also: *NMR Spectroscopy User Guide*

Related:

dg	Display group of acquisition/processing parameters (C)
dgs	Control dgs parameter group display (P)

dgs — Control dgs parameter group display (P)

Description: Controls display of the dgs command for the group of shims and automation parameters. `dgs`, a string parameter, can be modified by `paramvi('dgs')`.

See also: *NMR Spectroscopy User Guide*

Related:
- `dgs` Display group of special/automation parameters (M)
- `paramvi` Edit a parameter and its attributes with `vi` text editor (C)

`dhp` Decoupler high-power control with class C amplifier (P)

Applicability: System with a class C amplifier.

Description: `dhp` selects a decoupler high-power level for systems with class C amplifiers on the decoupler channel. Specific values of `dhp` should be calibrated periodically for any particular instrument and probe combination. As a rough guide, `dhp=75` corresponds to approximately 2 watts at 200 MHz.

CAUTION: **Decoupler power greater than 2 watts in a switchable probe will damage the probe. Always carefully calibrate high-power decoupling to avoid exceeding 2 watts of power.**

For systems equipped with a linear amplifier on the decoupler channel, `dhp` is nonfunctional and is replaced by the parameter `dpwr`.

Note that `dhp` runs in the opposite direction from `dlp` (i.e., for `dhp` a higher number means more power, for `dlp` a higher number means less power).

Values: 0 to 255 (where 255 is maximum power) in uncalibrated, non-linear units.

`'n'` selects low-power decoupling under the control of the parameter `dlp`.

See also: *NMR Spectroscopy User Guide*

Related:
- `dlp` Decoupler low power with class C amplifier (P)
- `dpwr` Power level for first decoupler with linear amplifier (P)
- `tn` Nucleus for observe transmitter (P)

`dialog` Display a dialog box from a macro (C)

Syntax: `dialog(definition_file,output_file<,'nowait'>)`

Description: Opens a dialog box from a macro. The output is written to a file that can be read by the macro using the `lookup` command.

Arguments: `definition_file` is the name of the file (specified by an absolute path) that defines the layout of the dialog box.

`output_file` is the name of the file (specified by an absolute path) where the results of the dialog box are written.

`'nowait'` is a keyword to return immediately, without waiting for input into the dialog box.

Examples: `dialog(userdir+'/dialoglib/array,'/tmp/array')`

See also: *User Programming*

Related:
- `lookup` Look up words and lines from a text file (C)

`diffparams` Report differences between two parameter sets (U)

Syntax: `diffparams <-list> file1 file2 <macroname>`

Description: Reports differences between parameter sets. A macro can optionally be created that will convert `file1` into `file2`.

Arguments: `file1` and `file2` are parameter files, like `$HOME/vnmrsys/exp1/procpar` `$HOME/vnmrsys/exp1/curpar` `$HOME/vnmrsys/global` `/vnmr/conpar` `xyz.fid/procpar` `file1` and `file2` can also be directories (`xyz.fid` or `xyz.par`, or a local experiment like `~/vnmrsys/exp1`); in this case `diffparams` will look for a subfile `procpar`

in these directories. The optional `-list` argument will cause a list of the parameters which are different to be printed. If the `-list` option is used, the macro feature is turned off. If a parameter exists in `file1` but not `file2`, it is not listed. If a parameter exists in `file2` but not `file1`, it is listed. If the parameter exists in both files, it is listed if the values are different. It is not listed if other information associated with the parameter is different. This other information is things like protection bits, maximum values, group, type, etc.

An optional third argument specifies the pathname of a macro to output. This macro will contain the MAGICAL commands necessary to convert `file1` into `file2`.

Examples:
```
diffparams abc.fid xyz.fid
diffparams -list abc.fid xyz.fid
diffparams ~/vnmrsys/exp1  ~/vnmrsys/exp3
diffparams ~/vnmrsys/exp1  ~/vnmrsys/exp3 ~/vnmrsys/
maclib/change1to3
```

diffshims — Compare two sets of shims (M,U)

Syntax: `diffshims(shimfile1,shimfile2)`
(From UNIX) `diffshims shimfile1 shimfile2`

Description: Compares values for room-temperature shims stored in two separate files.

Arguments: `shimfile1` and `shimfile2` are names of separate files containing shim values. Both files must have been written using the `svs` command.

See also: *NMR Spectroscopy User Guide*

Related:

`svs`	Save shim coil settings (C)

digfilt — Write digitally filtered FIDs to another experiment (M)

Syntax: `digfilt(exp_number<,option>)`

Description: Saves digitally filtered FIDs to another experiment.

Arguments: `exp_number` specifies the number of the experiment, from 1 to 9, for saving the FIDs.

`option` is one of the keywords `'nodc'`, `'zero'`, `'lfs'`, `'zfs'`, or `'t2dc'`. Use a keyword for an option if the same option was used when processing the data with `ft`, `wft`, `ft2d`, or `wft2d`.

See also: *NMR Spectroscopy User Guide*

Related:

`downsamp`	Sampling factor applied after digital filtering (P)
`ft`	Fourier transform 1D data (C)
`ft2d`	Fourier transform 2D data (C)
`wft`	Weight and Fourier transform 1D data (C)
`wft2d`	Weight and Fourier transform 2D data (C)

dir — List files in directory (C)

Syntax: `dir<(string)>`

Description: Displays files in a directory on the text window. The `dir` command is identical to the `ls` and `lf` commands.

Arguments: `string` is a string argument containing the options and/or directory names used if this were the UNIX `ls` command (e.g., `dir('-l *.fid')` requests a long listing (`-l`) of all files ending with `.fid` (`*.fid`)). If no argument is entered, `dir` lists all files in the current working directory.

Examples:
```
dir
dir('data')
dir('-l *.fid')
```

See also: *NMR Spectroscopy User Guide*

Related:

lf	List files in directory (C)
ls	List files in directory (C)

display — Display parameters and their attributes (C)

Syntax: `display(parameter|'*'|'**'<,tree>)`

Description: Displays one or more parameters and their attributes from a parameter tree.

Arguments: Three levels of display are available: `parameter`, `'*'`, and `'**'`.

- `parameter` is the name of a single parameter and the display is of its attributes (e.g., `display('a')` displays the attributes of parameter `a` in the (default) current tree).
- `'*'` is a keyword to display the name and values of all parameters in a tree (e.g., `display('*','global')` displays all parameter names and values in the global tree).
- `'**'` is a keyword to display the attributes of all parameters in a tree (e.g., `display('**','processed')` displays the attributes of all parameters in the processed tree).

`tree` is the type of parameter tree and can be `'global'`, `'current'`, `'processed'`, or `'systemglobal'`. The default is `'current'`. Refer to the `create` command for more information on types of trees.

Examples:
```
display('a')
display('*','global')
display('**','processed')
```

See also: *User Programming*

Related:

create	Create new parameter in a parameter tree (C)
destroy	Destroy a parameter (C)
paramvi	Edit a parameter and its attributes with the `vi` text editor (C)
prune	Prune extra parameters from current tree (C)

dla — Display spin simulation parameter arrays (M)

Syntax: `dla<('long')>`

Description: Displays the parameters containing the line assignments for spin simulation iteration (matching simulated spectra to actual data). A `clindex` value of a calculated transition gives the index of the assigned measured line. The value is zero for unassigned transitions.

Arguments: `'long'` is a keyword to display the parameters containing the line assignments for spin simulation iteration (matching simulated spectra to actual data) and put the line assignments into the file `spini.la`. This option is most useful when the `dla` display is too large to display all the calculated transitions in the text window. The `dlalong` command operates the same as the `dla('long')` command.

Examples:
```
dla
dla('long')
```

See also: *NMR Spectroscopy User Guide*

Related:

assign	Assign transitions to experimental lines (M)
clindex	Index of experimental frequency of a transition (P)
dga	Display parameters of spin simulation group (C)
dlalong	Long display of spin simulation parameter arrays (C)

dlalong — Long display of spin simulation parameter arrays (C)

Syntax: `dlalong`

Description: Puts line assignments into the file `spini.la` in a more complete form, then displays this file in the text window. It is most useful when the `dla` display is too large to display all the calculated transitions in the text window. The `dla('long')` command operates the same as `dlalong`.

See also: *NMR Spectroscopy User Guide*

Related:

dla	Display spin simulation parameter arrays (M)

dli — Display list of integrals (C)

Description: Displays a list of integrals at the integral reset points. The frequency units of the displayed list of integrals is controlled by the parameter `axis`. The reset points may be defined with the `z` command and these frequencies are stored in `lifrq`. The calculated amplitudes of the integral region are stored in `liamp`. The reset points are stored as hertz and are not referenced to `rfl` and `rfp`. The amplitudes are stored as the actual value; they are not scaled by `ins` or by `insref`. When the integral blanking mode is used (i.e., `intmod='partial'`), only the integrals corresponding to the displayed integral regions are listed.

The displayed integral value can be scaled with the `setint` macro. The integral is scaled by the parameters `ins` and `insref`.

See also: *NMR Spectroscopy User Guide*

Related:

axis	Axis label for displays and plots (P)
cz	Clear integral reset points (C)
dlni	Display list of normalized integrals (M)
ins	Integral normalization scale (P)
insref	Fourier number scaled value of an integral (P)
liamp	Amplitudes of integral reset points (P)
lifrq	Frequencies of integral reset points (P)
nli	Find integral values (C)
rfl	Reference peak position in directly detected dimension (P)
rfp	Reference peak frequency in directly detected dimension (P)
setint	Set value of an integral (M)
z	Add integral reset point at cursor position (C)

dlivast — Produce text file and process wells (M)

Applicability: VAST accessory.

Syntax: `dlivast<(last)>`

Description: Produces a text file containing the integral of the partial regions and processes the wells.

Arguments: `last` is the number of the last well. The default is 96.

See also: *NMR Spectroscopy User Guide*

Related:

combiplate	View a color map for visual analysis of VAST microtiter plate (U)
combishow	Display regions as red, green, and blue in CombiPlate window (M)

dll — Display listed line frequencies and intensities (C)

Syntax: `dll<('pos'<,noise_mult>)><:number_lines,scale>`

Description: Displays a list of line frequencies and amplitudes that are above a threshold defined by th. Frequency units are defined by the parameter axis. The results of this calculation are stored in llfrq and llamp. The frequencies are stored as Hz and are not referenced to rfl and rfp. Amplitudes are stored as the actual data point value; they are not scaled by vs.

Arguments: 'pos' is a keyword to list only positive lines.

noise_mult is a numerical value that determines the number of noise peaks listed for broad, noisy peaks. The default value is 3. A smaller value results in more peaks, a larger value results in fewer peaks, and a value of 0.0 results in a line listing containing all peaks above the threshold th. Negative values of noise_mult are changed to 3.

number_lines is a return argument with the number of lines above the threshold.

scale is a return argument with a scaling factor for line amplitudes. This scaling factor accounts for vs and whether the lines are listed in absolute intensity mode or normalized mode.

Examples:

```
dll
dll('pos')
dll(2.5)
dll:r1,sc
```

See also: *NMR Spectroscopy User Guide*

Related:

axis	Axis label for displays and plots (P)
dels	Delete spectra from T_1 or T_2 analysis (C)
fp	Find peak heights (C)
getll	Get frequency and intensity of a line (C)
llamp	List of line amplitudes (P)
llfrq	List of line frequencies (P)
nl	Position the cursor at the nearest line (C)
nll	Find line frequencies and intensities (C)
rfl	Reference peak position in directly detected dimension (P)
rfp	Reference peak frequency in directly detected dimension (P)
th	Threshold (P)
vs	Vertical scale (P)

dlni — Display list of normalized integrals (M)

Description: Displays integrals in a normalized format. The parameter ins represents the value of the sum of all the integrals. When the integral blanking mode is used (i.e., intmod='partial'), only the integrals corresponding to the displayed integral regions are listed and are used in the summation.

See also: *NMR Spectroscopy User Guide*

cz	Clear integral reset points (C)
dli	Display list of integrals (C)
ins	Integral normalization scale (P)

nli	Find integral values (C)
z	Add integral reset point at cursor position (C)

dlp — Decoupler low-power control with class C amplifier (P)

Applicability: Systems with a class C amplifier.

Description: dlp controls the decoupler power level for systems with a class C decoupler amplifier in the low-power mode, generally used for homonuclear decoupling. dlp specifies dB of attenuation of the decoupler, below a nominal 1 watt value. dlp is active only if dhp='n'.

On systems with a decoupler linear amplifier, dlp is nonfunctional and dpwr controls decoupler power.

Values: 0 to 39 (in dB of attenuation, 0 is maximum power).

See also: *NMR Spectroscopy User Guide*

Related:

dhp	Decoupler high-power control with class C amplifier (P)
dm	Decoupler mode for first decoupler (P)
dmf	Decoupler modulation frequency for first decoupler (P)
dpwr	Power level for first decoupler with linear amplifier (P)

dm — Decoupler mode for first decoupler (P)

Description: Determines the state of first decoupler during different status periods within a pulse sequence (refer to the manual *User Programming* for a discussion of status periods). Pulse sequences may require one, two, three, or more different decoupler states. The number of letters that make up the dm parameter vary appropriately, with each letter representing a status period (e.g., dm='yny' or dm='ns'). If the decoupler status is constant for the entire pulse sequence, it can be entered as a single letter (e.g., dm='n').

Values: 'n', 'y', 'a', or 's' (or a combination of these values), where:

'n' specifies no decoupler rf.

'y' specifies the asynchronous mode. In this mode, the decoupler rf is gated on and modulation is started at a random places in the modulation sequence.

'a' specifies the asynchronous mode, the same as 'y'.

's' specifies the synchronous mode in which the decoupler rf is gated on and modulation is started at the beginning of the modulation sequence.

See also: *NMR Spectroscopy User Guide*

Related:

dm2	Decoupler mode for second decoupler (P)
dm3	Decoupler mode for third decoupler (P)
dm4	Decoupler mode for fourth decoupler (P)
dmf	Decoupler modulation frequency for first decoupler (P)
dmm	Decoupler modulation mode for first decoupler (P)
dn	Nucleus for first decoupler (P)
decasynctype	Select the type of decoupler asynchronous mode (P)

dm2 — Decoupler mode for second decoupler (P)

Applicability: Systems with a second decoupler.

Description: Determines the state of second decoupler during different status periods within a pulse sequence. It functions analogously to dm.

Values: Same as dm, except that if dn2='' (two single quotes with no space in between) and a second decoupler is present in the console, dm2 assumes a default value of 'n' when go is executed.

See also: *NMR Spectroscopy User Guide*

Related:

dm	Decoupler mode of first decoupler (P)
dmf2	Decoupler modulation frequency for second decoupler (P)
dmm2	Decoupler modulation mode for second decoupler (P)
dn2	Nucleus for second decoupler (P)

dm3 — Decoupler mode for third decoupler (P)

Applicability: Systems with a third decoupler.

Description: Determines the state of third decoupler during different status periods within a pulse sequence. It functions analogously to dm.

Values: Same as dm, except that if dn3='' (two single quotes with no space in between) and a third decoupler is present in the console, dm3 assumes a default value of 'n' when go is executed.

See also: *NMR Spectroscopy User Guide*

Related:

dm	Decoupler mode of first decoupler (P)
dmf3	Decoupler modulation frequency for third decoupler (P)
dmm3	Decoupler modulation mode for third decoupler (P)
dn3	Nucleus for third decoupler (P)
decasynctype	Select the type of decoupler asynchronous mode (P)

dm4 — Decoupler mode for fourth decoupler (P)

Applicability: Systems with a deuterium decoupler channel as the fourth decoupler.

Description: Determines the state of fourth decoupler during different status periods within a pulse sequence. It functions analogously to dm.

Values: Same as dm, except that if dn4='' (two single quotes with no space in between) and a fourth decoupler is present in the console, dm4 assumes a default value of 'n' when go is executed.

See also: *NMR Spectroscopy User Guide*

Related:

dm	Decoupler mode of first decoupler (P)
dmf4	Decoupler modulation frequency for fourth decoupler (P)
dmm4	Decoupler modulation mode for fourth decoupler (P)
dn4	Nucleus for fourth decoupler (P)
decasynctype	Select the type of decoupler asynchronous mode (P)

dmf — Decoupler modulation frequency for first decoupler (P)

Description: Controls modulation frequency of the first decoupler. It specifies 1/pw90 at the particular power level used. After calibrating the decoupler field strength γH_2 (expressed in units of Hz), dmf should be set equal to $4*\gamma H_2$ for WALTZ, MLEV16, GARP, and XY32 (when available).

dmf is inactive for CW mode decoupling (dmm='c').

dmf is also active for square wave mode decoupling (dmm='r') and fm-fm mode (dmm='f') decoupling. For dmm='f', the modulation frequency is swept back and forth between about 0.5% and 5% of the dmf frequency (e.g., if dmf is 100 kHz, the modulation is swept between approximately 500 Hz and 5 kHz). A reasonable optimum value for dmf when dmm='f' is the decoupler frequency divided by 4000.

Values: 5 Hz to 2 MHz in steps of 5 Hz (steps are actually approximately 4.768 Hz).

For GARP modulation, the dmf value is internally multiplied by 45, making the limit of possible dmf values to 5 Hz to 44.4 kHz when dmm='g'.

See also: *NMR Spectroscopy User Guide*

Related:

dmf2	Decoupler modulation frequency for second decoupler (P)
dmf3	Decoupler modulation frequency for third decoupler (P)
dmf4	Decoupler modulation frequency for fourth decoupler (P)
dmm	Decoupler modulation mode for first decoupler (P)
pw90	90° pulse width (P)

dmf2 Decoupler modulation frequency for second decoupler (P)

Applicability: Systems with a second decoupler.

Description: Controls the modulation frequency of the second decoupler. It functions analogously to the parameter dmf.

Values: Same as dmf except that if dn2='' (two single quotes with no space in between) and a second decoupler is present in the console (numrfch greater than 2), dmf2 assumes a default value of 1000 Hz when go is executed.

See also: *NMR Spectroscopy User Guide*

Related:

dm2	Decoupler mode for second channel (P)
dmf	Decoupler modulation frequency for first decoupler (P)
dmm2	Decoupler modulation mode for second decoupler (P)
dn2	Nucleus for second decoupler (P)
numrfch	Number of rf channels (P)

dmf3 Decoupler modulation frequency for third decoupler (P)

Applicability: Systems with a third decoupler.

Description: Controls the modulation frequency of the third decoupler. It functions analogously to the parameter dmf.

Values: Same as dmf except that if dn3='' (two single quotes with no space in between) and a third decoupler is present in the console (numrfch equals 4), dmf3 assumes a default value of 1000 Hz when go is executed.

See also: *NMR Spectroscopy User Guide*

Related:

dm3	Decoupler mode for third channel (P)
dmf	Decoupler modulation frequency for first decoupler (P)
dmm3	Decoupler modulation mode for third decoupler (P)
dn3	Nucleus for third decoupler (P)
numrfch	Number of rf channels (P)

dmf4 Decoupler modulation frequency for fourth decoupler (P)

Applicability: Systems with a deuterium decoupler channel as the fourth decoupler.

Description: Controls the modulation frequency of the fourth decoupler. It functions analogously to the parameter dmf.

Values: Same as dmf except that if dn4='' (two single quotes with no space in between) and a fourth decoupler is present in the console (numrfch equals 5), dmf4 assumes a default value of 1000 Hz when go is executed.

See also: *NMR Spectroscopy User Guide*

Related:

dm4	Decoupler mode for fourth channel (P)
dmf	Decoupler modulation frequency for first decoupler (P)
dmm4	Decoupler modulation mode for fourth decoupler (P)
dn4	Nucleus for fourth decoupler (P)
numrfch	Number of rf channels (P)

dmfadj — Adjust tip-angle resolution time for first decoupler (M)

Syntax: `dmfadj<(tipangle_resolution)>`

Description: Adjusts the parameter dmf so that time associated with the first decoupler tip-angle resolution is an integral multiple of 50 ns. This eliminates time truncation error in execution of programmable decoupling or spin-locking sequence by the waveform generator. For example, the tip-angle resolution for an MLEV-16 decoupling sequence should be 90.0° since every pulse in that sequence can be represented as an integral multiple of 90.0°; however, the tip-angle resolution for a GARP decoupling sequence should be 1.0°.

Arguments: `tipangle_resolution` specifies the necessary tip-angle resolution for the programmable decoupling or spin-locking sequence to be executed. The default value is the current value of the parameter dres.

Examples:
```
dmfadj
dmfadj(90.0)
```

See also: *NMR Spectroscopy User Guide*

Related:

dmf	Decoupler modulation frequency for first decoupler (P)
dmf2adj	Adjust tip-angle resolution time for second decoupler (M)
dmf3adj	Adjust tip-angle resolution time third decoupler (M)
dmf4adj	Adjust tip-angle resolution time fourth decoupler (M)
dres	Tip angle resolution for programmable decoupling (P)

dmf2adj — Adjust tip-angle resolution time for second decoupler (M)

Applicability: Systems with a second decoupler.

Syntax: `dmf2adj<(tipangle_resolution)>`

Description: Adjusts the parameter dmf2 to make time associated with the second decoupler tip-angle resolution an integral multiple of 50 ns. `dmf2adj` functions analogously to the macro dmfadj.

Arguments: `tipangle_resolution` specifies the necessary tip-angle resolution for the programmable decoupling or spin-locking sequence to be executed. The default value is the current value of the parameter dres2.

Examples:
```
dmf2adj
dmf2adj(90.0)
```

See also: *NMR Spectroscopy User Guide*

Related:

dmf2	Decoupler modulation frequency for second decoupler (P)
dmfadj	Adjust decoupler tip-angle resolution time (M)
dres2	Tip angle resolution for second decoupler (P)

dmf3adj — Adjust tip-angle resolution time for third decoupler (M)

Applicability: Systems with a third decoupler.

Syntax: `dmf3adj<(tipangle_resolution)>`

Description: Adjusts the parameter dmf3 to make time associated with the third decoupler tip-angle resolution an integral multiple of 50 ns. dmf3adj functions analogously to the macro dmfadj.

Arguments: tipangle_resolution specifies the necessary tip-angle resolution for the programmable decoupling or spin-locking sequence to be executed. The default value is the current value of the parameter dres3.

Examples:
```
dmf3adj
dmf3adj(90.0)
```

See also: *NMR Spectroscopy User Guide*

Related:

dmf3	Decoupler modulation frequency for third decoupler (P)
dres3	Tip-angle resolution for third decoupler (P)

dmf4adj — Adjust tip-angle resolution time for fourth decoupler (M)

Applicability: Systems with a deuterium decoupler as the fourth decoupler.

Syntax: `dmf4adj<(tipangle_resolution)>`

Description: Adjusts the parameter dmf4 to make time associated with the fourth decoupler tip-angle resolution an integral multiple of 50 ns. dmf4adj functions analogously to the macro dmfadj.

Arguments: tipangle_resolution specifies the necessary tip-angle resolution for the programmable decoupling or spin-locking sequence to be executed. The default value is the current value of the parameter dres4.

Examples:
```
dmf4adj
```

See also: *NMR Spectroscopy User Guide*

Related:

dmf4	Decoupler modulation frequency for fourth decoupler (P)
dres4	Tip-angle resolution for fourth decoupler (P)

dmg — Data display mode in directly detected dimension (P)

Description: Controls the mode of data display along the directly detected dimension. dmg is in the display group and can be set manually or by executing the commands ph, av, pwr, or pa for the values 'ph', 'av', 'pwr', or 'pa', respectively.

Values: 'ph' sets the *phased mode* in which each real point in the displayed spectrum is calculated from a linear combination of real and imaginary points comprising each respective complex data point.

'av' sets the *absolute-value mode* in which each real point in the displayed spectrum is calculated as the square root of the sum of squares of the real and imaginary points comprising each respective complex data point.

'pwr' sets the *power mode* in which each real point in the displayed spectrum is calculated as the sum of squares of the real and imaginary points comprising each respective complex data point.

'pa' sets the *phase angle* mode in which each real point in the displayed spectrum is calculated as the phase angle from the arc tangent of the real and imaginary points comprising each respective complex data point.

See also: *NMR Spectroscopy User Guide*

Related:

aig	Absolute intensity group (P)
av	Set absolute-value mode in directly detected dimension (C)
dcg	Drift correction group (P)
dmg1	Data display mode in 1st indirectly detected dimension (P)
dmg2	Data display mode in 2nd indirectly detected dimension (P)
ft	Fourier transform 1D data (C)

ft1d	Fourier transform along f_2 dimension (C)
ft2d	Fourier transform 2D data (C)
pa	Set phase angle mode in directly detected dimension (C)
ph	Set phased mode in directly detected dimension (C)
pmode	Processing mode for 2D data (P)
pwr	Set power mode in directly detected dimension (C)
wft	Weigh and Fourier transform 1D data (C)
wft1d	Weigh and Fourier transform of 2D data (C)
wft2d	Weigh and Fourier transform 2D data (C)

dmg1 — Data display mode in 1st indirectly detected dimension (P)

Description: Controls the mode of data display along the first indirectly detected dimension of a multidimensional data set. dmg1 is in the display group and can be set manually or by executing the commands ph1, av1, pwr1, or pa1 for the values 'ph1', 'av1', 'pwr1', or 'pa1', respectively. If dmg1 does not exist or if it is set to the empty string (dmg1=''), VnmrJ uses the value of dmg to decide the display mode along the first indirectly detected dimension.

Values:
'ph1' sets phased mode.
'av1' sets absolute-value mode.
'pwr1' sets power mode.
'pa1' sets phase angle mode.

See also: *NMR Spectroscopy User Guide*

Related:

av1	Set absolute-value mode in 1st indirectly det. dim. (C)
dmg	Data display mode in directly detected dimension (P)
pa1	Set phase angle mode in 1st indirectly detected dimension (C)
ph1	Set phased mode in 1st indirectly detected dimension (C)
pwr1	Set power mode in 1st indirectly detected dimension (C)

dmg2 — Data display mode in 2nd indirectly detected dimension (P)

Description: Controls the mode of data display along the second indirectly detected dimension of a multidimensional data set. dmg2 is in the display group and can be set manually or by executing the commands ph2, av2, or pwr2 for the values 'ph2', 'av2', or 'pwr2', respectively. If dmg2 does not exist or if it is set to the empty string (dmg2=''), VnmrJ uses the value of the parameter dmg instead of dmg2 to decide the display mode along the second indirectly detected dimension.

Values:
'ph2' sets phased mode.
'av2' sets absolute-value mode.
'pwr2' sets power mode.

See also: *NMR Spectroscopy User Guide*

Related:

av2	Set absolute-value mode in 2nd indirectly det. dim. (C)
dmg	Data display mode in directly detected dimension (P)
ph2	Set phased mode in 2nd indirectly det. dim. (C)
pwr2	Set power mode in 2nd indirectly det. dim. (C)

dmgf — Absolute-value display of FID data or spectrum in acqi (P)

Description: If the parameter dmgf exists and is set to 'av', the FID display in the acqi program is set to the absolute-value mode, which displays the square root of the sum of the squares of the real and imaginary channels. dmgf has no function

outside of the acqi program. This display mode may cause the displayed FID to exceed the displayed ADC limits in acqi by as much as a factor of the square root of 2.

See also: *NMR Spectroscopy User Guide*

Related;

acqi	Interactive acquisition display process (C)
av	Set absolute-value mode in directly detected dimension (C)
gf	Prepare parameters for FID/spectrum display in acqi (M)

dmm — Decoupler modulation mode for first decoupler (P)

Description: Sets the modulation modes for the first decoupler. In the standard two-pulse sequence, dmm typically has a single state because the decoupler modulation is normally not changed during the pulse sequence, but this is not fixed. For example, dmm='ccw' gives single-frequency CW decoupling during the first part of the sequence and WALTZ-16 decoupling during acquisition.

In pulse sequences using the decoupler for pulsing (INEPT, DEPT, HETCOR, etc.), decoupler modulation must be set to 'c' during periods of the pulse sequence when the decoupler is to be pulsed.

Values: 'c', 'f', 'g', 'm', 'p', 'r', 'u', 'w', and 'x' are available;:

- 'c' sets continuous wave (CW) modulation.
- 'f' sets fm-fm modulation (swept-square wave).
- 'g' sets GARP modulation.
- 'm' sets MLEV-16 modulation.
- 'n' sets noise modulation.
- 'p' sets programmable pulse modulation using the dseq parameter to specify the decoupling sequence.
- 'r' sets square-wave modulation.
- 'u' sets user-supplied modulation using external hardware.
- 'w' sets WALTZ-16 modulation.
- 'x' sets XY32 modulation.

See also: *NMR Spectroscopy User Guide*

Related:

dm	Decoupler mode for first decoupler (P)
dmf	Decoupler modulation frequency for first decoupler (P)
dmm2	Decoupler modulation mode for second decoupler (P)
dmm3	Decoupler modulation mode for third decoupler (P)
dmm4	Decoupler modulation mode for fourth decoupler (P)
dseq	Decoupler sequence for the first decoupler (P)

dmm2 — Decoupler modulation mode for second decoupler (P)

Applicability: Systems with a second decoupler.

Description: Sets the type of decoupler modulation for the second decoupler during different status periods within a pulse sequence. It functions analogously to dmm.

Values: 'c', 'f', 'g', 'm', 'p', 'r', 'u', 'w', and 'x' are available. Refer to dmm for the definition of these values (note that if the mode 'p' is selected, dseq2 specifies the decoupling sequence). If dn2='' (two single quotes) and a second decoupler is present in the console (numrfch greater than 2), dmm2 is internally set to 'c' when go is executed.

See also: *NMR Spectroscopy User Guide*

Related:

dm2	Decoupler modulation for the second decoupler (P)
dmf2	Decoupler modulation frequency for the second decoupler (P)
dmm	Decoupler modulation mode for first decoupler (P)
dn2	Nucleus for the second decoupler (P)
dseq2	Decoupler sequence for the second decoupler (P)
numrfch	Number of rf channels (P)

dmm3 Decoupler modulation mode for third decoupler (P)

Applicability: Systems with a third decoupler.

Description: Sets type of decoupler modulation for the third decoupler during different status periods within a pulse sequence. It functions analogously to dmm.

Values: 'c', 'f', 'g', 'm', 'p', 'r', 'u', 'w', and 'x' are available. Refer to dmm for the definition of these values (note that if the mode 'p' is selected, dseq3 specifies the decoupling sequence). If dn3='' (two single quotes) and a third decoupler is present in the console (numrfch equal to 4), dmm3 is internally set to 'c' when go is executed.

See also: *NMR Spectroscopy User Guide*

Related:

dm3	Decoupler modulation for third decoupler (P)
dmf3	Decoupler modulation frequency for third decoupler (P)
dmm	Decoupler modulation mode for first decoupler (P)
dn3	Nucleus for the third decoupler (P)
dseq3	Decoupler sequence for the third decoupler (P)
numrfch	Number of rf channels (P)

dmm4 Decoupler modulation mode for fourth decoupler (P)

Applicability: Systems with a deuterium decoupler channel as the fourth decoupler.

Description: Sets type of decoupler modulation for the fourth decoupler during different status periods within a pulse sequence. It functions analogously to dmm.

Values: 'c', 'f', 'g', 'm', 'r', 'u', 'w', and 'x' are available. Refer to dmm for the definition of these values. If dn4='' (two single quotes) and a fourth decoupler is present in the console (numrfch greater than 4), dmm4 is internally set to 'c' when go is executed.

See also: *NMR Spectroscopy User Guide*

Related:

dm4	Decoupler modulation for the fourth decoupler (P)
dmf4	Decoupler modulation frequency for the fourth decoupler (P)
dmm	Decoupler modulation mode for first decoupler (P)
dn4	Nucleus for the fourth decoupler (P)
dseq4	Decoupler sequence for the fourth decoupler (P)
numrfch	Number of rf channels (P)

dn Nucleus for first decoupler (P)

Description: Changing the value of dn causes a macro (named _dn) to be executed that extracts values for dfrq and dof from lookup tables. The tables, stored in the directory /vnmr/nuctables, are coded by atomic weights.

Values: In the lookup tables, typically 'H1', 'C13', 'P31', etc.

See also: *NMR Spectroscopy User Guide*

Related:		
	dfrq	Transmitter frequency of first decoupler (P)
	dn2	Nucleus for second decoupler (P)
	dn3	Nucleus for third decoupler (P)
	dn4	Nucleus for fourth decoupler (P)
	dof	Frequency offset for first decoupler (C)
	tn	Nucleus for observe transmitter (P)

dn2 Nucleus for second decoupler (P)

Applicability: Systems with a second decoupler.

Description: Changing the value of dn2 causes a macro (named _dn2) to be executed that extracts values for dfrq2 and dof2 from lookup tables. Otherwise, dn2 functions analogously to the parameters tn and dn. If an experiment does not use the second decoupler channel, the channel can be disabled by setting dn2='' (two single quotes with no space in between). This sets dm2='n', dmm2='c', dmf2=1000 (in Hz), dfrq2=1 (in MHz), dof2=0, dpwr2=0, dseq2='', and dres2=1.

See also: *NMR Spectroscopy User Guide*

Related:		
	dfrq2	Transmitter frequency of second decoupler (P)
	dn	Nucleus for first decoupler (P)
	dof2	Frequency offset for second decoupler (C)
	numrfch	Number of rf channels (P)
	tn	Nucleus for observe transmitter (P)

dn3 Nucleus for third decoupler (P)

Applicability: Systems with a third decoupler.

Description: Changing the value of dn3 causes a macro (named _dn3) to be executed that extracts values for dfrq3 and dof3 from lookup tables. Otherwise, dn3 functions analogously to the parameters tn and dn. If an experiment does not use the third decoupler channel, the channel can be disabled by setting dn3='' (two single quotes with no space in between). This sets dm3='n', dmm3='c', dmf3=1000 (in Hz), dfrq3=1 (in MHz), dof3=0, dpwr3=0, dseq3='', and dres3=1.

See also: *NMR Spectroscopy User Guide*

Related:		
	dn	Nucleus for first decoupler (P)
	dfrq3	Transmitter frequency of third decoupler (P)
	dof3	Frequency offset for third decoupler (C)
	numrfch	Number of rf channels (P)
	tn	Nucleus for observe transmitter (P)

dn4 Nucleus for fourth decoupler (P)

Applicability: Systems with a deuterium decoupler channel as the fourth decoupler.

Description: Changing the value of dn4 causes a macro (named _dn4) to be executed that extracts values for dfrq4 and dof4 from lookup tables. Otherwise, dn4 functions analogously to the parameters tn and dn except that the only valid value for dn4 is 'H2'. If an experiment does not use the fourth decoupler channel, the channel can be disabled by setting dn4='' (two single quotes with no space in between). This sets dm4='n', dmm4='c', dmf4=1000 (in Hz), dfrq4=1 (in MHz), dof4=0, dpwr4=0, dseq4='', and dres4=1.

See also: *NMR Spectroscopy User Guide*

Related:

dfrq4	Transmitter frequency of fourth decoupler (P)
dn	Nucleus for first decoupler (P)
dof4	Frequency offset for fourth decoupler (C)
numrfch	Number of rf channels (P)
tn	Nucleus for observe transmitter (P)

dndfid — Retrieve and process fid data from the locator (M)

Applicability: Liquids, Imaging, Solids

Description: Retrieve fid data from an item selected in the locator. Data is also processed if Process data on drag-and-drop from locator is selected in the System settings dialog in the Utilities menu.

Related:

dndjoin	Join a work space from the locator (M)
dndpar	Retrieve a parameter set from the locator (M)
dndshims	Retrieve a shimset set from the locator (M)
locaction	Locator action (M)
locprotoexec	Execute a protocol from the locator (M)
xmmakenode	Make a new study queue node (M)

dndjoin — Join a work space from the locator (M)

Description: Join the work space selected by the locator.

Related:

dndfid	Retrieve and process fid data from the locator (M)
dndpar	Retrieve a parameter set from the locator (M)
dndshims	Retrieve a shimset set from the locator (M)
locaction	Locator action (M)
locprotoexec	Execute a protocol from the locator (M)
xmmakenode	Make a new study queue node (M)

dndpar — Retrieve a parameter set from the locator (M)

Description: Retrieve a parameter set selected by the locator.

Related:

dndfid	Retrieve and process fid data from the locator (M)
dndjoin	Join a work space from the locator (M)
dndshims	Retrieve a shimset set from the locator (M)
locaction	Locator action (M)
locprotoexec	Execute a protocol from the locator (M)
xmmakenode	Make a new study queue node (M)

dndshims — Retrieve a shimset set from the locator (M)

Description: Retrieve a shimset set selected by the locator.

Related:

dndfid	Retrieve and process fid data from the locator (M)
dndjoin	Join a work space from the locator (M)
dndpar	Retrieve a parameter set from the locator (M)
locaction	Locator action (M)
locprotoexec	Execute a protocol from the locator (M)
xmmakenode	Make a new study queue node (M)

D

dnode — Display list of valid limNET nodes (M,U)

Applicability: Systems with limNET.

Description: Displays the contents of the user's limNET node database (i.e., all remote nodes available to limNET). Each node is listed by name, Ethernet address (6 hexadecimal bytes), and burst size

See also: *NMR Spectroscopy User Guide*

Related:

eaddr	Display Ethernet address (M,U)

doautodialog — Start a dialog window using def file (M)

Applicability: Systems with automation.

Syntax: doautodialog

Description: Internal macro used by enter to start a dialog window using the def file for an experiment in the dialoglib directory.

Related:

enter	Enter sample information for automation run (M,U)

dodialog — Start a dialog window with dialoglib file (M)

Syntax: dodialog

Description: Internal macro that starts a dialog window using a dialog file in the dialoglib directory.

dof — Frequency offset for first decoupler (P)

Description: Controls the frequency offset of the first decoupler. Higher numbers move the decoupler to higher frequency (toward the left side of the spectrum). The frequency accuracy of the decoupler offset is generally0.1 Hz. The value is specified in the config program.

Values: –100000 to 100000 Hz (approximate, depends on frequency), in steps of 0.1 Hz.

See also: *NMR Spectroscopy User Guide*

Related:

config	Display current configuration and possible change it (M)
dof2	Frequency offset for second decoupler (P)
dof3	Frequency offset for third decoupler (P)
dof4	Frequency offset for fourth decoupler (P)
tof	Frequency offset for observe transmitter (P)

dof2 — Frequency offset for second decoupler (P)

Applicability: Systems with a second decoupler.

Description: Controls the frequency offset for the second decoupler. dof2 functions analogously to the parameters tof and dof.

Values: –100000 to 100000 Hz (approximate, depends on frequency), in steps of 0.1 Hz. If dn2='' (two single quotes with no space in between) and a second decoupler channel is present in the console, dof2 assumes a default value of 0 when go is executed.

See also: *NMR Spectroscopy User Guide*

Related:

dn2	Nucleus for second decoupler (P)
dof	Frequency offset for first decoupler (P)
tof	Frequency offset for observe transmitter (P)

dof3 — Frequency offset for third decoupler (P)

Applicability: Systems with a third decoupler.

Description: Controls the frequency offset for the third decoupler. dof3 functions analogously to the parameters tof and dof.

Values: –100000 to 100000 Hz (approximate, depends on frequency), in steps of 0.1 Hz. If dn3='' (two single quotes with no space in between) and a third decoupler channel is present in the console, dof3 assumes a default value of 0 when go is executed.

See also: *NMR Spectroscopy User Guide*

Related:

dn3	Nucleus for third decoupler (P)
dof	Frequency offset for first decoupler (P)
tof	Frequency offset for observe transmitter (P)

dof4 — Frequency offset for fourth decoupler (P)

Applicability: Systems with a deuterium decoupler channel as the fourth decoupler.

Description: Controls the frequency offset for the fourth decoupler. dof4 functions analogously to the parameters tof and dof.

Values: –100000 to 100000 Hz (approximate, depends on frequency), in steps of 2.384 Hz. If dn4='' (two single quotes with no space in between) and a fourth decoupler channel is present in the console, dof4 assumes a default value of 0 when go is executed.

See also: *NMR Spectroscopy User Guide*

Related:

dn4	Nucleus for fourth decoupler (P)
dof	Frequency offset for first decoupler (P)
tof	Frequency offset for observe transmitter (P)

Doneshot — Set up parameters for Doneshot pulse sequence (M)

Description: Converts a parameter set to Doneshot experiment.

See also: *NMR Spectroscopy User Guide*

Related:

dosy	Process DOSY experiments (M)
fiddle	Perform reference deconvolution (M)
setup_dosy	Set up gradient levels for DOSY experiments (M)

dopardialog — Start a dialog with dialoglib/experiment def file (M)

Description: Internal macro that starts a dialog window using a def file in the directory dialoglib/experiment.

do_pcss — Calculate proton chemical shifts spectrum (C)

Syntax: do_pcss<(<threshold><,max_cc><,max_width)>

Description: Strips a high-resolution proton spectrum down to a list of chemical shifts. The list is saved in the file pcss.outpar. If no argument is given, do_pcss automatically calculates the threshold and uses default values for the maximum allowable coupling constant and the maximum width of a spin multiplet.

Arguments: threshold sets the level whether a point belongs to a peak or is noise.

max_cc is the maximum allowable coupling constant in the spectrum. Default is 20 Hz.

`max_width` is the maximum width of a spin multiplet in the spectrum. Default is 60 Hz.

Examples:
```
do_pcss
do_pcss(10)
do_pcss(9,20,80)
```

See also: *NMR Spectroscopy User Guide*

Related:
- `pcss` Calculate and show proton chemical shifts spectrum (M)

dosy — Process DOSY experiments (M)

Syntax: `dosy(<'prune'>,<lowerlimit,upperlimit>)`

Description: Performs a DOSY (diffusion ordered spectroscopy) analysis of the data in an array of spectra.

`dosy` uses the commands `dll` and `fp` to determine the heights of all signals above the threshold defined by the parameter `th` and then fits the decay curve for each signal to a Gaussian using the program `dosyfit`. It stores a summary of all diffusion coefficients and their estimated standard errors and various other results as follows:

- In the directory `$HOME/vnmrsys/Dosy`: diffusion_display.inp, general_dosy_stats, calibrated_gradients, fit_errors, and diffusion_spectrum
- In the current experiment: a second copy of diffusion_display.inp.

The command `showdosy` has been incorporated into `dosy`.

Arguments: `prune` starts a dialog to allow one or more spectra to be omitted from the analysis.
`lowerlimit` is the lower diffusion limit (in units of 10^{-10} m^2/s) to be displayed.
`upperlimit` is the upper diffusion limit (in units of 10^{-10} m^2/s) to be displayed.

Without arguments, `dosy` uses all the experimental spectra and covers the whole diffusion range seen in the experimental peaks.

See also: *NMR Spectroscopy User Guide*

Related:
- `ddif` Synthesize and display DOSY plot (C)
- `fiddle` Perform reference deconvolution (M)
- `setup_dosy` Set up gradient levels for DOSY experiments (M)

dosy2d — Apptype macro for dosy 2D experiments (M)

Applicability: Liquids

Description: Performs the actions for 2D dosy protocols to set up, process, and plot experiments. It is only available if the Dosy software is installed.

Related:
- `apptype` Application type (PM)
- `execpars` Set up the exec parameters (M)

dosyfrq — Larmor frequency of phase encoded nucleus in DOSY (P)

Description: Stores the NMR frequency of the phase encoded nucleus in DOSY experiments. It is directly set by the DOSY sequences.

See also: *NMR Spectroscopy User Guide*

Related:
- `dosy` Process DOSY experiments (M)

dosygamma — Gyromagnetic constant of phase encoded nucleus in DOSY (P)

Description: Stores the gyromagnetic constant of the phase encoded nucleus in DOSY experiments. It is automatically set by the DOSY sequences and used by the dosy macro.

See also: *NMR Spectroscopy User Guide*

Related:

dosy	Process DOSY experiments (M)

dosytimecubed — Gyromagnetic constant of phase encoded nucleus in DOSY (P)

Description: Time cubed factor in the expression for diffusional attenuation. It is automatically set by the DOSY sequences and used by the dosy macro.

See also: *NMR Spectroscopy User Guide*

Related:

dosy	Process DOSY experiments (M)

dot1 — Set up a T_1 experiment (M)

Syntax: `dot1<(min_T1_estimate,max_T1_estimate,time)>`

Description: Sets up all parameters to perform a T_1 experiment, including d1, pw, p1, nt, and an array of d2 values, based on information entered you enter. Make sure that the parameter pw90 is set properly and contains the correctly calibrated 90° pulse width because dot1 uses this information. If you have not done a pulse width calibration recently, you may wish to do so now.

Minimum and maximum T_1 for the peaks of interest are estimates. Do the best you can. Your estimates are used to select optimum values of d2. If the T_1 does not fall between your two guesses, your experiment may not be optimum, but it should still be usable unless your estimates are extremely far off. When you are satisfied with the parameters, enter ga or au to acquire the data.

Arguments: min_T1_estimate is the estimated minimum expected T_1. The default is the system prompts the user for the value.

max_T1_estimate is the estimated maximum expected T_1. The default is the system prompts the user for the value.

time is the total time in hours that the experiment should take. The default is the system prompts the user for the value.

Examples:

```
dot1
dot1(1,2,.5)
```

See also: *NMR Spectroscopy User Guide*

Related:

d1	First delay (P)
d2	Incremented delay in 1st indirectly detected dimension (P)
ga	Submit experiment to acquisition and FT the result (C)
go	Submit experiment to acquisition (C)
nt	Number of transients (P)
p1	First pulse width (P)
pw	Pulse width (P)
pw90	90° pulse width (P)

dotflag — Display FID as connected dots (P)

Description: When sparse FID data points are displayed, they are displayed as unconnected dots. If dotflag exists and is set to 'n', the FID dots will be connected. To create dotflag, enter create('dotflag','flag'). To create dotflag and the FID display parameters axisf, vpf, vpfi, crf, and

deltaf (if the parameter set is older and lacks these parameters), enter addpar('fid').

Values: 'n' sets connecting the dots. 'y' sets not connecting the dots.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
create	Create new parameter in a parameter tree (C)
df	Display a single FID (C)

downsamp — Downsampling factor applied after digital filtering (P)

Description: Specifies the downsampling factor applied after digital filtering. The spectral width of the data set after digital filtering and downsampling is sw divided by downsamp, where sw is the acquired spectral width. If downsamp does not exist in the current experiment, enter addpar('downsamp') to add it. addpar('downsamp') creates the digital filtering and downsampling parameters downsamp, dscoef, dsfb, dslsfrq, and filtfile.

Values: Number for the downsampling factor. 1 sets digital filtering with a filter bandwidth specified by dsfb without downsampling.

'n' sets normal data processing without digital filtering.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to current experiment (M)
digfilt	Write digitally filtered FID to another experiment (M)
dscoef	Digital filter coefficients for downsampling (P)
dsfb	Digital filter bandwidth for downsampling (P)
dslsfrq	Bandpass filter offset for downsampling (P)
filtfile	File of FIR digital filter coefficients (P)
pards	Create additional parameters used by downsampling (M)
sw	Spectral width in directly detected dimension (P)

dp — Double precision (P)

Description: Sets whether data are acquired in a 16-bit or 32-bit integer format.

Values: 'n' sets 16-bit format, 'y' sets 32-bit format. If the 200-kHz receiver option is installed (Max. Narrowband Width set to 200 kHz in the Spectrometer Configuration window), dp is forced to 'n' if 120000<sw<=200000. If sw>200000, dp is forced to 'y'. On wideline systems, dp='y' is required when sw>100000.

See also: *NMR Spectroscopy User Guide*

Related:

sw	Spectral width in directly detected dimension (P)

dpcon — Display plotted contours (C)

Syntax: dpcon(<options,><levels,spacing>)

Description: Produces a true contour plot display.

Arguments: options must precede levels and spacing in the argument list and can be one or more of the following:

- 'pos' is a keyword to limit the display to positive peaks only in phased spectra. The default is both positive and negative peaks.
- 'neg' is a keyword to limit the display to negative peaks only in phased spectra.

- 'noaxis' is a keyword to omit outlining the display and drawing the horizontal or vertical axis.

levels is the maximum number of contours to be shown. The default is 4.

spacing is the spacing by relative intensity of successive contour levels. The default is 2.

Examples:
```
dpcon
dpcon('pos',6)
dpcon(15,1.4)
```

See also: *NMR Spectroscopy User Guide*

Related:

dcon	Display noninteractive color intensity map (C)
dconi	Control display selection for the dconi program (P)
dpconn	Display plotted contours without screen erase (C)
pcon	Plot contours on plotter (C)

dpconn — Display plotted contours without screen erase (C)

Syntax: `dpconn(<options,><levels,spacing>)`

Description: Produces a true contour plot display exactly the same as the dpcon command, but without erasing the screen before drawing. The arguments are entered the same as dpcon.

See also: *NMR Spectroscopy User Guide*

Related:

dpcon	Display plotted contours (C)

dpf — Display peak frequencies over spectrum (C)

Syntax:
```
(1) dpf<(<'noll'><,'pos'><,noise_mult><,'top'>)>
(2) dpf<(<'noll'><,'pos'><,noise_mult><,'leader'>
      <,length>)>
```

Description: Displays peak frequencies in the graphics window, with units specified by the axis parameter. Only those peaks greater than th high are selected. If the interactive command ds is active, dpf deactivates it.

Two basic modes of label positioning are available: labels placed at the top, with *long leaders* extending down to the tops of the lines (syntax 1 using 'top' keyword) or labels positioned just above each peak, with *short leaders* (syntax 2 using 'leader' keyword). The default is short leaders.

Arguments: 'noll' is a keyword to display frequencies using last previous line listing.

'pos' (or 'noneg') is a keyword to display positive peaks only.

noise_mult is a numerical value that determines the number of noise peaks displayed for broad, noisy peaks. The default is 3. A smaller value results in more peaks, a larger value results in fewer peaks, and a value of 0.0 results in a line listing containing all peaks above the threshold th. Negative values of noise_mult are changed to a value of 3. The noise_mult argument is inactive when the 'noll' keyword is specified.

'top' is a keyword to display peak labels at the top with long leaders. In this mode, the height of labels is varied by changing the parameter wc2.

'leader' is a keyword to display labels positioned just above each peak.

length specifies the leader length, in mm, if labels are positioned just above each peak. The default is 20.

Examples:
```
dpf('pos')
dpf('leader',30)
```

```
dpf('top','noll')
dpf('pos',0.0,'leader',30)
```

See also: *NMR Spectroscopy User Guide*

Related:

axis	Axis label for displays and plots (P)
dpir	Display integral amplitudes below spectrum (C)
dpirn	Display normalized integral amplitudes below spectrum (M)
pir	Plot integral amplitudes below spectrum (C)
pirn	Plot normalized integral amplitudes below spectrum (M)
ppf	Plot peak frequencies over spectrum (M)
th	Threshold (P)
vp	Vertical position of spectrum (P)
wc2	Width of chart in second direction (P)

dpir — Display integral amplitudes below spectrum (C)

Description: Displays integral amplitudes below the appropriate spectral regions.

See also: *NMR Spectroscopy User Guide*

Related:

dpf	Display peak frequencies over spectrum (C)
dpirn	Display normalized integral amplitudes below spectrum (M)
pir	Plot integral amplitudes below spectrum (C)
pirn	Plot normalized integral amplitudes below spectrum (M)
ppf	Plot peak frequencies over spectrum (M)

dpirn — Display normalized integral amplitudes below spectrum (M)

Description: Equivalent to the command dpir except that the sum of the integrals is normalized to the value of the parameter ins.

See also: *NMR Spectroscopy User Guide*

Related:

dpir	Display integral amplitudes below spectrum (C)
ins	Integral normalization scale (P)
pirn	Plot normalized integral amplitudes below spectrum (M)

dpiv — Display integral values below spectrum (M)

Syntax: `dpiv<(vertical_position)>`

Description: Labels integrals with a bracket below the spectrum and a vertical number indicating the integral value.

- vertical labels for narrower regions
- avoids label overlap by label shifting
- more flexible vertical positioning

The vertical position defaults to a location just underneath the scale labels, assuming there is enough room below the scale. If the vertical position is too low, the vertical position is allowed to approach the position of the spectrum up to 1 mm. If the spectral position is so low that the integral labels would overlap with the spectrum, an error message is produced (indicating the minimum vp), and the command aborts. No error message is produced in case of overlap with the scale. The minimum for vp depends on the plotter and the character size, and in the case of dpiv also on the size of the graphics window.

Use an optional argument to force the vertical position to any value; no checking is done, and no error message is produced in case of overlap. `piv(vp-2)` produces integral labels with the brackets ending 2 mm below the position of the spectrum.

dpiv follows this convention: the output is controlled by ins and insref and not by is. Restore the is integration mode by creating a (local or global) parameter oldint and set oldint= 'y':

```
create('oldint','flag','global')
oldint='y'
```

oldint='n' (or destroy the parameter) switches back to the default integration mode.

Examples:

```
vp=25 dpiv
vp=50 pl pscale piv(0)
```

Related:

dpir	Display integral amplitudes below spectrum (C)
dpirn	Display normalized integral amplitudes below spectrum (C)
dpivn	Display normalized integral amplitudes below spectrum (M)
pirn	Plot normalized integral amplitudes below spectrum (C)
pir	Plot integral amplitudes below spectrum (C)
piv	Plot integral amplitudes below spectrum (M)
pivn	Plot normalized integral amplitudes below spectrum (M)

dpivn — Display normalized integral values below spectrum (M)

Syntax: dpivn<(vertical_position)>

Description: Labels integrals with a bracket below the spectrum and a vertical number indicating the integral value.

See dpiv for description and use.

Related:

dpir	Display integral amplitudes below spectrum (C)
dpirn	Display normalized integral amplitudes below spectrum (C)
dpiv	Display integral amplitudes below spectrum (M)
pirn	Plot normalized integral amplitudes below spectrum (C)
pir	Plot integral amplitudes below spectrum (C)
piv	Plot integral amplitudes below spectrum (M)
pivn	Plot normalized integral amplitudes below spectrum (M)

dpl — Default plot (M)

Description: Looks for sequence-specific default plot macro (dpl_*seqfil*) and executes if one is found.

Related:

dpl_seqfil	Sequence-specific default plot (M)
dpr	Default process (M)
dds	Default display (M)

dpl_*seqfil* — Sequence-specific default plot (M)

Description: Sequence-specific default plot. These macros are called by the dpl macro.

Examples:

```
dpl_NOESY1D
dpl_TOCSY1D
```

Related:

dpl	Default plot (M)
dpr	Default process (M)
dds	Default display (M)

D

dplane — Display a 3D plane (M)

Syntax: `dplane(<plane_type,>plane_number)`

Description: Displays the 2D color map of a particular data plane from a 3D spectral data set. The 3D parameters are loaded into VnmrJ each time `dplane` is executed. The parameter `path3d` specifies the absolute path to the directory (without the `.extr` file extension) where the 2D planes extracted from the 3D spectral data set reside.

Arguments: `plane_type` is one of the keywords `'f1f3'`, `'f2f3'`, and `'f1f2'` for the f_1f_3, f_2,f_3, and f_1f_2 planes, respectively. If `plane_type` is specified, the parameter `plane` is updated with that new value. `plane` is then used to determine the type of 3D plane to be displayed.

`plane_number` specifies which plane of a particular type is to be displayed:

- For plane f_1f_3, the range of plane_number is `1` to `fn2/2`
- For plane f_2f_3, the range of plane_number is `1` to `fn1/2`
- For plane f_1f_2, the range of plane_number is `1` to `fn/2`

Examples:
```
dplane(3)
dplane('f1f2',2)
```

See also: *NMR Spectroscopy User Guide*

Related:

`dsplanes`	Display a series of 3D planes (M)
`dproj`	Display a 3D plane projection (M)
`getplane`	Extract planes from a 3D spectral data set (M)
`nextpl`	Display the next 3D plane (M)
`path3d`	Path to currently displayed 2D planes from a 3D data set (P)
`plane`	Currently displayed 3D plane type (P)
`prevpl`	Display the previous 3D plane (M)
`plplanes`	Plot a series of 3D planes (M)

dpr — Default process (M)

Description: Looks for sequence-specific default plot macro (`dpr_`*`seqfil`*) and executes if one is found.

Related:

`dpr_seqfil`	Sequence-specific default process (M)
`dpl`	Default plot (M)
`dds`	Default display (M)

dpr_*seqfil* — Sequence-specific default process (M)

Description: Sequence-specific default plot. These macros are called by the `dpr` macro.

Examples:
```
dpr_NOESY1D
dpr_TOCSY1D
```

Related:

`dpr`	Default process (M)
`dpl`	Default plot (M)
`dds`	Default display (M)

dprofile — Display pulse excitation profile (M)

Syntax: `dprofile<(axisflag<,profile<,shapefile>>)>`

Description: Displays the X, Y and Z excitation (inversion) profile for a pulse shape generated by the Pbox software. If `shapefile` is not provided, the last simulation data stored in the `shapelib/pbox.sim` file are displayed.

Arguments: The `axisflag` and `profile` arguments can be given in any order.

`axisflag` is `'y'` to display the full spectrum and a frequency scale, or `'n'` to suppress the scale and spectrum. The default is `'n'`.

`profile` is a character string identifying the desired profile. `'xyz'` selects X, Y, and Z (inversion) profiles; `'xy'` selects only the excitation (transverse) profiles; `'x'` selects only the X transverse excitation profile; and `'z'` selects only the inversion profile. The default is `'xyz'`.

`shapefile` is the name of a *.RF or *.DEC file, including the extension.

Examples:
```
dprofile
dprofile('y','xy')
dprofile('xy','n','softpls.RF')
```

See also: *NMR Spectroscopy User Guide*

Related:

`pprofile`	Plot pulse excitation profile (M)
`Pbox`	Pulse shaping software (U)

dproj — Display a 3D plane projection (M)

Syntax: `dproj<(plane_type)>`

Description: Displays 2D color map of the 2D projection plane from a 3D spectral data set. The projection is a skyline projection. The 3D parameters are loaded into VnmrJ each time `dproj` is executed. For this macro, the parameter `path3d` specifies the directory (without the `.extr` extension) where the 2D projection resides that has been created from the 3D spectral data set.

Arguments: `plane_type` is one of the keywords `'f1f3'`, `'f2f3'`, and `'f1f2'` for the f_1f_3, f_2,f_3, and f_1f_2 planes, respectively. If `plane_type` is specified, the parameter `plane` is updated with that value. `plane` is then used to determine the type of 2D projection to be displayed.

Examples:
```
dproj
dproj('f1f2')
```

See also: *NMR Spectroscopy User Guide*

Related:

`dplane`	Display a 3D plane (M)
`dsplanes`	Display a series of 3D planes (M)
`getplane`	Extract planes from a 3D spectral data set (M)
`nextpl`	Display the next 3D plane (M)
`path3d`	Path to currently displayed 2D planes from a 3D data set (P)
`plane`	Currently displayed 3D plane type (P)
`plplanes`	Plot a series of 3D planes (M)
`prevpl`	Display the previous 3D plane (M)

dps — Display pulse sequence (C)

Syntax: `dps<(file),x,y,width,height>`

Description: Displays a picture of pulse sequences consisting of three to five parts. The top part is the transmitter pulse sequence (Tx). The second part is the decoupler pulse sequence (Dec). The third part might be the second or third decoupler (Dec2 or Dec3) pulse sequence or gradients (X, Y, or Z), depending on the program. The lowest part is the status.

The pulse parameters are displayed if there is enough space an if the length of the parameter name is less than thirty letters. The value of each pulse is also displayed. If the value delay or width is less than zero, a question mark (?) is displayed. The time units are displayed in color (on a color monitor). The height of pulses is scaled according to their power level.

dps also displays spin lock, transmitter gating, observe transmitter power, and other information.

Arguments: file specifies the name of the file containing the pulse sequences. The default is the file seqfil.

x,y specifies the start of the position with respect to the lower-left corner of the window.

width,height are in proportion to wcmax and wc2max.

See also: *NMR Spectroscopy User Guide*

Related:

pps	Plot pulse sequence (C)
seqfil	Pulse sequence name (P)
wc	Width of chart (P)
wcmax	Maximum width of chart (P)
wc2max	Maximum width of chart in second direction (P)

dpwr — Power level for first decoupler with linear amplifier (P)

Applicability: Systems with a linear amplifier.

Description: On systems equipped with a linear amplifier, a 63-dB or 79-dB attenuator between the decoupler transmitter and the amplifier controls the power level.

The system value for the attenuator upper safety limit is set fin the Spectrometer Configuration window (opened by config). The Upper Limit entry sets this value. For broadband decoupling of ^{1}H nuclei, typical values range from 36 to 49 dB. For homonuclear decoupling, typical values range from 5 to 15 dB.

Values: 79 dB, -16 to +63, in steps of 1 dB.

Decoupler power greater than 2 watts in a switchable probe will damage the probe. Always carefully calibrate decoupling to avoid exceeding 2 watts. The maximum value for dpwr on a 200-, 300-, or 400-MHz system with a linear amplifier on the decoupler channel has been set to 49, corresponding to about 2 watts of power. Before using dpwr=49 for continuous decoupling, ensure safe operation by measuring the output power. This should be done during system installation and checked periodically by the user.

See also: *VnmrJ Installation and Administration*

Related:

cattn	Coarse attenuator (P)
config	Display current configuration and possible change it (M)
dpwrf	First decoupler fine power (P)
dpwr2	Power level for second decoupler (P)
dpwr3	Power level for third decoupler (P)
dpwr4	Power level for fourth decoupler (P)
fattn	Fine attenuator (P)
tpwr	Power level of observe transmitter with linear amplifiers (P)
tpwrf	Observe transmitter fine power (P)

dpwr2 — Power level for second decoupler with linear amplifier (P)

Applicability: Systems with a linear amplifier as the second decoupler.

Description: Controls the coarse attenuator (63 dB or 79 dB) that resides between the transmitter board and the linear amplifier associated with the second decoupler.

The system value for the attenuator upper safety limit is set in the Spectrometer Configuration window (opened by config).

Values: 79 dB, -16 to +63, in steps of 1 dB.

If dn2='' (two single quotes) and a second decoupler channel is present in the console, dpwr2 assumes a default value of 0 when go is executed.

CAUTION: **Decoupler power greater than 2 watts in a switchable probe will damage the probe. Always carefully calibrate decoupling to avoid exceeding 2 watts. The maximum value for dpwr2 on a 200-, 300-, or 400-MHz system with a linear amplifier on the decoupler channel has been set to 49, corresponding to about 2 watts of power. Before using dpwr2=49 for continuous decoupling, ensure safe operation by measuring the output power. This should be done during system installation and checked periodically by the user.**

See also: *NMR Spectroscopy User Guide*

Related:

cattn	Coarse attenuator type (P)
config	Display current configuration and possible change it (M)
dn2	Nucleus for second decoupler (P)

dpwr3 — Power level for third decoupler with linear amplifier (P)

Applicability: Systems with a linear amplifier as the third decoupler.

Description: Controls the coarse attenuator (63 dB or 79 dB) that resides between the transmitter board and the linear amplifier associated with the third decoupler. The system value for the attenuator upper safety limit is set in the Spectrometer Configuration window (opened by config).

Values: If 63-dB attenuator installed: 0 to 63 (63 is max. power), in units of dB.
If 79-dB attenuator installed: –16 to 63 (63 is max. power), in units of dB. If dn3='' (two single quotes) and a third decoupler channel is present in the console, dpwr3 assumes a default value of 0 when go is executed.

CAUTION: **Decoupler power greater than 2 watts in a switchable probe will damage the probe. Always carefully calibrate decoupling to avoid exceeding 2 watts. The maximum value for dpwr3 on a 200-, 300-, or 400-MHz system with a linear amplifier on the decoupler channel has been set to 49, corresponding to about 2 watts of power. Before using dpwr3=49 for continuous decoupling, ensure safe operation by measuring the output power. This should be done during system installation and checked periodically by the user.**

See also: *NMR Spectroscopy User Guide*

Related:

cattn	Coarse attenuator type (P)
config	Display current configuration and possible change it (M)
dn3	Nucleus for third decoupler (P)

dpwr4 — Power level for fourth decoupler amplifier (P)

Applicability: Systems with deuterium decoupler channel as the fourth decoupler.

Description: Controls the coarse attenuator (45 dB range) that resides on the Lock Transceiver board and the amplifier associated with the fourth decoupler. The system value for the attenuator upper safety limit is set in the Spectrometer Configuration window (opened by config).

Values: 48-dB attenuator: 15 to 63 (63 is max. power), in units of dB.
If dn4='' (two single quotes) and a third decoupler channel is present in the console, dpwr4 assumes a default value of 0 when go is executed.

CAUTION: **Decoupling power greater than 5 watts applied to a triple-resonance probe will damage the probe. The maximum value for `dpwr4` is 63, corresponding to about 35 watts to the probe. A value of `dpwr4` equal to 52 corresponds to about 5 watts and will produce approximately a 1 kHz decoupling field. Always carefully calibrate decoupling power to avoid exceeding 5 watts. Before using `dpwr4=52` continuous decoupling, ensure safe operation by measuring the output power. Measurement should be taken during system installation and checked periodically by the user.**

See also: *NMR Spectroscopy User Guide*

Related:

`cattn`	Coarse attenuator type (P)
`config`	Display current configuration and possible change it (M)
`dn3`	Nucleus for third decoupler (P)

`dpwrf` First decoupler fine power (P)

Applicability: Systems with an optional fine attenuator on the decoupler channel.

Description: Controls the first decouple fine attenuator. Systems with this attenuator are designated within the Spectrometer Configuration window (opened by `config`) by the status of the Fine Attenuator entry. The fine attenuator is linear and spans 6 dB.

Values: 0 to 4095 (where 4095 is maximum power). If `dpwrf` does not exist in the parameter table, a value of 4095 is assumed.

See also: *User Programming, User Guide: Solids; CP/MAS Installation,*

Related:

`config`	Display current configuration and possibly change it (M)
`dpwr`	Power level for first decoupler with linear amplifiers (P)
`dpwrf2`	Second decoupler fine power (P)
`dpwrf3`	Third decoupler fine power (P)
`dpwrm`	First decoupler linear modulator power (P)
`fattn`	Fine attenuator (P)
`tpwr`	Power level of observe transmitter with linear amplifiers (P)
`tpwrf`	Transmitter fine power (P)

`dpwrf2` Second decoupler fine power (P)

Applicability: Systems with an optional fine attenuator on the second decoupler channel.

Description: Controls the second decoupler fine attenuator, functioning analogously to `dpwrf`.

Values: 0 to 4095 (where 4095 is maximum power). If `dpwrf2` does not exist in the parameter table, a value of 4095 is assumed.

See also: *User Programming*

Related:

`dpwrf`	First decoupler fine power (P)

`dpwrf3` Third decoupler fine power (P)

Applicability: Systems with an optional fine attenuator on the third decoupler channel.

Description: Controls the third decoupler fine attenuator, functioning analogously to `dpwrf`.

Values: 0 to 4095 (where 4095 is maximum power). If `dpwrf3` does not exist in the parameter table, a value of 4095 is assumed.

See also: *User Programming*

Related:

`dpwrf`	First decoupler fine power (P)

dpwrm **First decoupler linear modulator power (P)**

Applicability: Systems with a first decoupler linear modulator.
The fine power control is linear and spans 0 to dpwr.

Values: 0 to 4095 (where 4095 is maximum power). If dpwrm does not exist in the parameter table, a value of 4095 is assumed.

See also: *User Programming; User Guide: Solids; CP/MAS Installation*

Related:

dpwrm2	Second decoupler linear modulator power (P)
dpwrm3	Third decoupler linear modulator power (P)
tpwrm	Observe transmitter linear modulator power (P)

dpwrm2 **Second decoupler linear modulator power (P)**

Applicability: Systems with a second decoupler linear modulator.

Description: Controls the second decoupler linear modulator systems.

Values: 0 to 4095 (where 4095 is maximum power). If dpwrm2 does not exist in the parameter table, a value of 4095 is assumed.

See also: *User Programming*

Related:

dpwrm	First decoupler linear modulator power (P)

dpwrm3 **Third decoupler linear modulator power (P)**

Applicability: Systems with a third decoupler linear modulator.

Description: Controls the third decoupler linear modulator systems.

Values: 0 to 4095 (where 4095 is maximum power). If dpwrm3 does not exist in the parameter table, a value of 4095 is assumed.

See also: *User Programming*

Related:

dpwrm	First decoupler linear modulator power (P)

Dqcosy **Convert the parameter to a DQCOSY experiment (M)**

Description: Convert the parameter to a double-quantum filtered (DQCOSY) experiment

See also: *NMR Spectroscopy User Guide*

Related:

cosyps	Set up parameters for phase-sensitive COSY (M)
Cosy	Set up parameters for COSY pulse sequence (M)
relayh	Set up parameters for COSY pulse sequence (M)

draw **Draw line from current location to another location (C)**

Syntax: `draw(<'keywords'>x,y)`

Description: Draws a line from the current location to the absolute location with coordinates given by the arguments.

Arguments: `'keywords'` identifies the output device (`'graphics'` | `'plotter'`), drawing mode (`'xor'` | `'normal'`), and drawing capability (`'newovly'` | `'ovly'` | `'ovlyC'`).

- `'graphics'|'plotter'` is a keyword for the output device. The default is `'plotter'`. The output selected is passed to subsequent pen, move, or draw commands and remains active until a different output is specified.

- `'xor','normal'` is a keyword for the drawing mode when using the `'graphics'` output device. The default is `'normal'`. In the `'xor'` mode, if a line is drawn such that one or more points of the line are in common with a previous `'xor'` line, the common points are erased. In the `normal` mode, the common points remain. The mode selected is passed to subsequent `draw`, `pen`, and `move` commands and remains active until a different mode is specified.
- `'newovly'`, `'ovly'`, and `'ovlyC'` are keywords that specify an interactive drawing capability that is slightly slower than the `'xor'` mode but more consistent in color. `'newovly'` clears any previous draws, boxes, and writes made with the `'ovly'` modes and draws the figure. `'ovly'` draws without clearing so that multisegment figures can be created. `'ovlyC'` clears without drawing.

`x,y` are the absolute coordinates, in mm, of the endpoint of the line to be drawn. The range of `x` is `0` at the left edge of the chart and `wcmax` at the right edge. The range of `y` is `-20` at the bottom of the chart and `wc2max` at the top.

Examples:
```
draw('graphics','xor'.wcmax-sc,vp+th)
draw(wcmax-sc-wc*(cr-delta-sp)/wp,wc2max)
```

See also: *NMR Spectroscopy User Guide*

Related:

`gin`	Return current mouse position and button values (C)
`move`	Move to an absolute location (C)
`pen`	Select a pen or color for drawing (C)
`wcmax`	Maximum width of chart (P)
`wc2max`	Maximum width of chart in second direction (P))

`dres` Measure linewidth and digital resolution (C)

Syntax:
```
dres<(<freq<,fractional_height>>)>
   :linewidth,digital_resolution
```

Description: Analyzes the line defined by the current cursor position for its linewidth (width at half-height) and digital resolution.

Arguments: `freq` is the frequency of the line. The default is the parameter `cr`. This overrides using the current cursor position as the frequency.

`fractional_height` is the linewidth is measured at this height.

`linewidth` is the value returned for the linewidth of the line.

`digital_resolution` is the value returned for the digital resolution of the line.

Examples:
```
dres:$width,$res
dres(cr,0.55)
```

See also: *NMR Spectroscopy User Guide; User Programming*

Related:

`cr`	Current cursor position (P)
`dsn`	Measure signal-to-noise (C)

`dres` Tip-angle resolution for first decoupler (P)

Applicability: Systems with waveform generators.

Description: Controls the tip-angle resolution to be used within a waveform generator decoupling sequence on the first decoupler. The optimum value is a function of the decoupling sequence to be used: for WALTZ-16, `dres=90.0`; for MLEV16-240, `dres=30.0`; and for GARP1, `dres=1.0`.

Values: 1.0 to 90.0, in units of degrees. In reality, dres can assume values as small of 0.7 (but no smaller) and can be specified in units of 0.1°. To use this capability, change the limits of dres by using destroy('dres') create('dres','real') setlimit('dres',360,0.7,0.1). Making corresponding changes within the fixpar macro ensures that dres is created in the desired way with each new parameter set.

See also: *NMR Spectroscopy User Guide*

Related:

dmfadj	Adjust decoupler tip-angle resolution time (M)
dres2	Tip angle resolution for second decoupler (P)
dres3	Tip angle resolution for third decoupler (P)
fixpar	Correct parameter characteristics in experiment (M)

dres2 — Tip-angle resolution for second decoupler (P)

Applicability: Systems with waveform generators.

Description: Controls the tip-angle resolution to be used within a waveform generator decoupling sequence on the second decoupler. The optimum value is a function of the decoupling sequence to be used: for WALTZ-16, dres2=90.0; for MLEV16-240, dres2=30.0; and for GARP1, dres2=1.0.

Values: 1.0 to 90.0, in units of degrees.

See also: *NMR Spectroscopy User Guide*

Related:

dmf2adj	Adjust second decoupler tip-angle resolution time (M)
dres	Tip-angle resolution for first decoupler (P)

dres3 — Tip-angle resolution for third decoupler (P)

Applicability: Systems with waveform generators.

Description: Controls the tip-angle resolution to be used within a waveform generator decoupling sequence on the third decoupler. The optimum value is a function of the decoupling sequence to be used: for WALTZ-16, dres3=90.0; for MLEV16-240, dres3=30.0; and for GARP1, dres3=1.0.

Values: 1.0 to 90.0, in units of degrees.

See also: *NMR Spectroscopy User Guide*

Related:

dmf3adj	Adjust third decoupler tip-angle resolution time (M)
dres	Tip-angle resolution for first decoupler (P)

dres4 — Tip-angle resolution for fourth decoupler (P)

Applicability: Systems with deuterium decoupler channel as the fourth decoupler.

Description: Controls the tip-angle resolution to be used for the decoupling sequence on the fourth decoupler. The optimum value is a function of the decoupling sequence to be used: for WALTZ-16, dres4=90.0; for MLEV16-240, dres4=30.0; and for GARP1, dres4=1.0.

Values: 1.0 to 90.0, in units of degrees.

See also: *NMR Spectroscopy User Guide*

Related:

dmf4adj	Adjust fourth decoupler tip-angle resolution time (M)
dres	Tip-angle resolution for first decoupler (P)

D

ds — Display a spectrum (C)

Syntax: (1) `ds<(index)>`
(2) `ds<(options)>`

Description: Displays a single spectrum. Parameter `intmod` controls integral display:

- `intmod='off'` turns off the integral display
- `intmod='full'` displays the entire integral
- `intmod='partial'` displays every other integral region

Parameter entry after a spectrum has been displayed with the `ds` command causes the spectrum to be updated.

Two additional parameters control the behavior of the `ds` command:

- The parameter `phasing` (in the "global" parameter set) controls the percentage of the spectrum updated during interactive phasing. This parameter can be set in the range of 10 to 100. A value of 100 causes the entire spectrum to be updated. A value of 20 causes the area between the two horizontal cursors to be updated.
- The parameter `lvltlt` (in the "current" parameter set) controls the sensitivity of the interactive `lvl` and `tlt` adjustments. `lvltlt` can be set to any positive real number. It is basically a multiplier for the sensitivity. The default value is 1.0. Larger values make the adjustments larger. Smaller values make the adjustments smaller.

For arrayed 1D spectra or for 2D spectra, a particular trace can be viewed by supplying the index number as an argument. For 2D data sets, spectra can be displayed from either the f_1 or f_2 domain by setting the parameter `trace` equal to `'f1'` or `'f2'`, respectively. After entering `ft1d`, interferograms can be viewed by setting `trace='f1'` and then typing `ds`.

Spectra are scaled according to the number of completed transients `ct`. If `nt` is arrayed (`nt=1,2,4,8`), each spectrum is scaled by its own `ct`.

Arguments: `index` (used with syntax 1) is the index number of a particular trace to be displayed in arrayed 1D spectra or in 2D spectra (syntax 1).

`options` (used with syntax 2) is any of the following keywords:

- `'toggle'` switches between the box and the cursor modes.
- `'restart'` redraws the cursor if it has been turned off.
- `'expand'` toggles between expanded and full view of the spectrum.
- `'spwp'` interactively adjusts start and width of the spectrum display.
- `'phase'` enters an interactive phasing mode.
- `'thresh'` interactively adjusts the threshold.
- `'z'` interactively sets integral resets.
- `'dscale'` toggles the scale below the spectrum on and off.
- `'lvltlt'` interactively adjusts the `lvl` and `tlt` parameters.
- `'scwc'` interactively adjusts the start and width of chart.
- `'noclear'` start or restart the ds display without clearing the graphics screen
- `'exists'` exit the `ds` display, leaving a non-interactive `dss` display.

Examples:

```
ds
ds(7)
ds('restart')
```

See also: *NMR Spectroscopy User Guide*

Related:

crmode	Current state of cursors in dfid, ds, or dconi (P)
ct	Completed transients (P)
exists	
ft1d	Fourier transform along f_2 dimension (C)
intmod	Integral display mode (P)
lp	First-order phase in directly detected dimension (P)
lvl	Zero-order baseline correction (P)
lvltlt	Control sensitivity of lvl and tlt adjustments (P)
nt	Number of transients (P)
phasing	Control update region during ds phasing (P)
rp	Zero-order phase in directly detected dimension (P)
select	Select a spectrum without displaying It (C)
tlt	First-order baseline correction (P)
trace	Mode for n-dimensional data display (P)
wft1d	Weight and Fourier transform f_2 for 2D data (C)

ds2d — Display 2D spectra in whitewash mode (C)

Syntax: ds2d<(options)>

Description: Displays a stacked plot of 2D spectra in whitewash mode (after the first spectra, each spectra is blanked out in regions in which it is behind an earlier spectra). Color does not represent intensity (unlike dcon), because intensity can be seen visually, but instead successive traces are displayed in different colors so that color represents frequency.

Arguments: options can be any of the following keywords:

- 'nobase' is a keyword to activate the th parameter to suppress all intensity below the th level.
- 'fill' is a keyword to fill in the peaks. When using 'fill', th operates linearly and not logarithmically (factors of 2) as it does in the contour or color intensity displays.
- 'fillnb' is a keyword to combine base suppression and peak filling. When using 'fillnb', th operates linearly and not logarithmically (factors of 2) as it does in the contour or color intensity displays.
- 'noaxis' is a keyword to omit outlining the display and drawing the horizontal and vertical axis.

Examples:

```
ds2d
ds2d('fillnb')
```

See also: *NMR Spectroscopy User Guide*

Related:

dcon	Display noninteractive color intensity map (C)
dconi	Control display selection for the dconi program (P)
ds2dn	Display 2D spectra in whitewash mode without screen erase (C)
pl2d	Plot 2D spectra in whitewash mode (C)
th	Threshold (P)

ds2dn — Display 2D spectra in whitewash mode without screen erase (C)

Syntax: ds2dn<(options)>

Description: Displays a stacked plot of 2D spectra in whitewash mode (after the first spectra, each spectra is blanked out in regions in which it is behind an earlier spectra) the same as ds2d but without erasing the screen before drawing. The arguments are the same as ds2d.

Examples:
```
ds2dn
ds2dn('fillnb')
```

See also: *NMR Spectroscopy User Guide*

Related:

ds2d	Display 2D spectra in whitewash mode (C)

dsnarray — Report statistical signal-to-noise for Cold Probes (M)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Report the statistical S/N of a series of repeated gNhsqc data sets acquired with a labeled protein sample.

dscale — Display scale below spectrum or FID (C)

Syntax: `dscale<(<rev><,axis><,label><,vp0><,sp0><,color><,pen>)>`

Description: Displays a scale under a spectrum or FID.

Arguments: `rev` – reverses the direction of the scale. That is, the smaller numbers will be at the left side of the scale. If used, `'rev'` must be the first argument.

`axis` – If the letter `p`, `h`, `k`, etc. is supplied, it will be used instead of the current value of the parameter `axis`. For an FID scale, if the letter `s`, `m`, or `u` is supplied, it will be used instead of the current value of the parameter `axisf`.

`label` – If a string of 2 or more characters is supplied, it will be used as the axis label.

`vp0` – This is supplied as the first real number. It defines the vertical position where the scale is drawn. The default is 5 mm below the current value of the parameter `vp`.

`sp0` – This is supplied as the second real number. It is a modified start of plot. If, for example, the display is from 347 to 447 hz, but the scale is desired to read 0 to 100 hz., `sp0` would be input as 0.

`wp0` – This is supplied as the third real number. It is a modified width of plot. If, for example, the display is from 347 to 447 hz, but the scale is desired to read 0 to 550 Units. sp0 would be input as 0, `wp0` would be 550, and the label would be 'Units'.

An optional color or pen number can be supplied to dscale or `pscale`. The available colors and pens are: `'red'`, `'green'`, `'blue'`, `'cyan'`, `'magenta'`, `'yellow'`, `'black'`,`'white'`
`'pen1'`, `'pen2'`, `'pen3'`,..., `'pen8'`

Examples:
```
dscale
dscale('rev')
dscale('h',0,'green')
dscale('h',vp-10,0)
```

See also: *NMR Spectroscopy User Guide*

Related:

axis	Axis label for displays and plots (P)
axisf	Axis label for FID displays and plots (P)
pscale	Plot scale below spectrum or FID (C)
vp	Vertical position of spectrum (P)

dscoef — Digital filter coefficients for downsampling (P)

Description: Specifies the number of coefficients used in the digital filter. This parameter does not need to be changed as the parameter `downsamp` is changed, because `dscoef` is automatically adjusted by VnmrJ to give filter cutoffs that are the same, regardless of the value of `downsamp`. This is done by using

dscoef*downsamp/2 coefficients in the digital filter. VnmrJ always rounds dscoef*downsamp/2 to an odd number. If dscoef does not exist in the current experiment, enter addpar('downsamp') to add it. Entering addpar('downsamp') creates the digital filtering and downsampling parameters downsamp, dscoef, dsfb, dslsfrq, and filtfile.

Values: Number of digital filter coefficients. The default is 61. A larger number of coefficients gives a filter with sharper cutoffs; a smaller number gives a filter with more gradual cutoffs.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to current experiment (M)
downsamp	Downsampling factor applied after digital filtering (P)
dsfb	Digital filter bandwidth for downsampling (P)
dslsfrq	Bandpass filter offset for downsampling (P)
filtfile	File of FIR digital filter coefficients (P)
pards	Create additional parameters used for downsampling (M)

dseq — Decoupler sequence for first decoupler (P)

Applicability: Systems with waveform generators.

Description: Specifies the decoupling sequence (without the .DEC file extension) to be used during any period of programmable decoupling on the first decoupler under status control (i.e., dmm='p'). The decoupling sequence must be located in the user's shapelib directory or in the VnmrJ system's shapelib directory.

See also: *NMR Spectroscopy User Guide*

Related:

dmm	Decoupler modulation mode for first decoupler (P)
dseq2	Decoupler sequence for second decoupler (P)
dseq3	Decoupler sequence for third decoupler (P)

dseq2 — Decoupler sequence for second decoupler (P)

Applicability: Systems with waveform generators.

Description: Specifies the decoupling sequence (without the .DEC file extension) to be used during any period of programmable decoupling on the second decoupler under status control (i.e., dmm2='p'). The decoupling sequence must be located in the user's shapelib directory or in the VnmrJ system shapelib directory.

See also: *NMR Spectroscopy User Guide*

Related:

dmm2	Decoupler modulation mode for second decoupler (P)
dseq	Decoupler sequence for first decoupler (P)

dseq3 — Decoupler sequence for third decoupler (P)

Applicability: Systems with waveform generators.

Description: Specifies the decoupling sequence (without the .DEC file extension) to be used during any period of programmable decoupling on the third decoupler under status control (i.e., dmm3='p'). The decoupling sequence must be located in the user's shapelib directory or in the shapelib directory.

See also: *NMR Spectroscopy User Guide*

Related:

dmm3	Decoupler modulation mode for third decoupler (P)
dseq	Decoupler sequence for first decoupler (P)

D

dseq4 — Decoupler sequence for fourth decoupler (P)

Applicability: Systems with waveform generators.

Description: Specifies the decoupling sequence (without the .DEC file extension) to be used during any period of programmable decoupling on the third decoupler under status control (i.e., dmm4='p'). The decoupling sequence must be located in the user's shapelib directory or in the system's shapelib directory.

See also: *NMR Spectroscopy User Guide*

Related:

dmm4	Decoupler modulation mode for third decoupler (P)
dseq	Decoupler sequence for first decoupler (P)

dsfb — Digital filter bandwidth for downsampling (P)

Description: Specifies the bandwidth of the digital filter used for downsampling. If dsfb does not exist in the current experiment, enter addpar('downsamp') to add it. addpar('downsamp') creates the digital filtering and downsampling parameters downsamp, dscoef, dsfb, dslsfrq, and filtfile.

Values: Number, in Hz. A smaller value rejects frequencies at the spectrum edges; a larger value aliases noise and signals at frequencies outside of ±sw/2.

'n' makes dsfb default to the final sw/2.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to current experiment (M)
downsamp	Downsampling factor applied after digital filtering (P)
dscoef	Digital filter coefficients for downsampling (P)
dslsfrq	Bandpass filter offset for downsampling (P)
filtfile	File of FIR digital filter coefficients (P)
pards	Create additional parameters used for downsampling (M)
sw	Spectral width in directly detected dimension (P)

dshape — Display pulse shape or modulation pattern (M)

Syntax: dshape<(pattern.ext)>

Description: Displays the real (X) and imaginary (Y) components of a shaped pulse. Any type of waveform (.RF, .DEC or .GRD) can be displayed.

Arguments: pattern is the name of a shape or pattern file specified by an absolute file name, relative file name, or a simple pattern file name. ext is a file name extension that specifies the file type. In the case of a simple file name, dshape searches for the file in the local directory, then in the user's shapelib, and finally in the directory /vnmr/shapelib. If pattern.ext is not given, dshape displays the last created waveform stored in the pbox.fid file.

Examples:

```
dshape
dshape('Pbox.RF')
```

See also: *NMR Spectroscopy User Guide*

Related:

Pbox	Pulse shaping software (U)
pshape	Plot pulse shape or modulation pattern (M)

dshapef — Display last generated pulse shape (M)

Description: Displays the real (X) and imaginary (Y) components of last generated shaped pulse, stored in pbox.fid file.

See also: *NMR Spectroscopy User Guide*

Related:
- `Pbox` — Pulse shaping software (U)
- `pshapef` — Plot last generated pulse shape (M)

dshapei — Display pulse shape or modulation pattern interactively (M)

Syntax: `dshapei<(pattern.ext)>`

Description: Displays the real (X) and imaginary (Y) components of a pulse shape, modulation pattern or gradient shape interactively. `dshapei` overwrites the existing data (FID) after the permission is granted by the user. It also asks for the duration of the waveform and displays the timescale.

Arguments: `pattern` is the name of a shape or pattern file specified by an absolute file name, relative file name, or a simple pattern file name. `ext` is a file name extension that specifies the file type. In the case of a simple file name, `dshapei` searches for the file in the local directory, then in the user's `shapelib`, and finally in the directory `/vnmr/shapelib`. If no file name is given, `dshapei` displays the last created waveform stored in the `pbox.fid` file.

Examples:
```
dshapei
dshapei('myfile.DEC')
```

See also: *NMR Spectroscopy User Guide*

Related:
- `Pbox` — Pulse shaping software (U)

dshim — Display a shim “method” string (M)

Syntax:
(1) `dshim<(file)>`
(2) `dshim('method'|'help')`

Description: Looks in the user's `shimmethods` directory and then in the system `shimmethods` directory for a file and displays the file (syntax 1) or displays information about `method` strings (syntax 2).

Arguments: `file` is the name of a file to be searched for in the `shimmethods` directories. The default is to display the contents of the `shimmethods` directories.

`'method'` is a keyword to explain the structure of `method` strings.

`'help'` is a keyword to describe the `method` strings in the system’s `shimmethods` directory.

Examples:
```
dshim
dshim('method')
dshim('help')
```

See also: *NMR Spectroscopy User Guide*

Related:
- `method` — Autoshim method (P)
- `newshm` — Interactively create a shim “method” with options (M)
- `shim` — Submit an Autoshim experiment to acquisition (C)
- `stdshm` — Interactively create a shim “method” (M)

dslsfrq — Bandpass filter offset for downsampling (P)

Description: For downsampling, selects a bandpass filter that is not centered about the transmitter frequency. In this way, `dslsfrq` works much like `lsfrq`. If `dslsfrq` does not exist in the current experiment, add it by entering `addpar('downsamp')`. The command `addpar('downsamp')` creates

the digital filtering and downsampling parameters downsamp, dscoef, dsfb, dslsfrq, and filtfile.

Values: A number, in Hz. A positive value selects a region upfield from the transmitter frequency; a negative value selects a downfield region.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to current experiment (M)
downsamp	Downsampling factor applied after digital filtering (P)
dscoef	Digital filter coefficients for downsampling (P)
dsfb	Digital filter bandwidth for downsampling (P)
filtfile	File of FIR digital filter coefficients (P)
lsfrq	Frequency shift of the fn spectrum in Hz (P)
movedssw	Set parameters for digital filtering and downsampling (M)
pards	Create additional parameters used by downsampling (M)

dsn — Measure signal-to-noise (C)

Syntax: `dsn<(low_field,high_field)>:signal_to_noise,noise`

Description: Measures the signal-to-noise ratio of the spectrum by first measuring the intensity of the largest peak in the spectral range defined by sp and wp, and then measuring the noise in the spectral region defined by the position of the two cursors. The noise value returned from dsn is not scaled by vs. The interrelations between the signal-to-noise ratio, the noise, and peak intensities can be illustrated by comparing `dsn:$sn,$noise` and `peak:$signal`. In this case, $sn is equal to `($signal /$noise)/vs`.

Calculate noise by first doing a drift correction on the noise region. Noise is defined as:

$$noise = \left(\sum_{1=1}^{np} Y_i^2 / np \right)^{\frac{1}{2}}$$

Y_i^2 values are the square of the drift-corrected amplitude and np is the number of points in the noise region.

Arguments: low_field and high_field are the upper and lower frequencies of the noise region to be measured. The default is the position of the two cursors.

signal_to_noise is the calculated value of signal-to-noise ratio.

noise is the noise value measured within the defined spectral region.

Examples:

```
dsn:$ston
dsn(sp+sp,sp+wp-100)
dsn(10000,8000):r1
```

See also: *User Programming*

Related:

dres	Measure linewidth and digital resolution (C)
peak	Find tallest peak in specified region (C)
sp	Start of plot (P)
vs	Vertical scale (P)
wp	Width of plot (P)

dsnmax — Calculate maximum signal-to-noise (M)

Syntax: `dsnmax<(noise_region)>`

Description: Finds the best signal-to-noise in a specified region.

Arguments: `noise_region` is the size, in Hz, of the region. The default is the region between the cursors as defined by the parameter `delta`.

Examples:
```
dsnmax
dsnmax(400)
```

See also: *User Programming*

Related:

`delta`	Cursor difference in directly detected dimension (P)

dsp — Display calculated spectrum (C)

Syntax: `dsp<(file<,'nods'>)>`

Description: Using the current table of transitions and intensities, `dsp` recalculates the simulated spectrum (using the current value for the linewidth `slw`) and displays the spectrum. `dsp` can only be used after the `spins` program has been run. If only the linewidth `slw` or vertical scale `svs` have been changed, `dsp` can be used to redisplay the spectrum. If a chemical shift or coupling constant has been changed, however, `dsp` will not display a spectrum reflecting the changes in the parameter; `spins` must be run again to recalculate the new spectrum.

The number of points in the calculated spectrum is `fn/2`. To increase the number of points, change `fn` and rerun `dsp` without doing a transform.

To display a synthetic spectrum, prepare a file in the following format:

```
Freq1, Intens1, LineWidth1, GaussFrac1
Freq2, Intens2, LineWidth2, GaussFrac2
...
FreqN, IntensN, LineWidthN, GaussFracN
```

The units for frequency and line width are Hz. The Gaussian fraction, which is the percentage of the line shape that is Gaussian (the rest is Lorentzian) should be between 0 and 1 (i.e., 0 is pure Lorentzian, 1 is pure Gaussian). Units for intensity are not particularly important. Given numbers in a file `myshape`, it is only necessary to enter `dsp('myshape')` to display the synthetic spectrum. This approach is often preferred over deconvolution for quantifying small shoulders on large peaks.

Arguments: `file` is the name of a file containing spectral information that displays the result of a spectrum deconvolution. Any file in the proper format can be used to generate a display. The default is the file `spins.outdata` in the experiment directory. This file contains information about frequencies, intensities, line widths, and Gaussian/Lorentzian fractions.

`'nods'` is a keyword for `dsp` to recalculate the simulated spectrum but not to display the spectrum. The spectrum can be displayed with the `ds` or `dss` command.

Examples:
```
dsp
dsp('fitspec.outpar')
```

See also: *NMR Spectroscopy User Guide*

Related:

`ds`	Display a spectrum (C)
`dss`	Display stacked spectra (C)
`fn`	Fourier number in directly detected dimension (P)
`slw`	Spin simulation linewidth (P)
`spins`	Perform spin simulation calculation (C)
`svs`	Spin simulation vertical scale (P)

dsp — Type of DSP for data acquisition (P)

Description: Selects the type of DSP (digital signal processing) for data acquisition:

- *Inline DSP* performs digital filtering and downsampling on the workstation immediately after each oversampled FID is transferred from the console. sw and at should be set to the values desired for the final spectrum. Only the digital filtered and downsampled data is written to the disk. Selective detection of a region of a spectrum is available using the moveossw macro.
- *Real-time DSP* uses optional hardware (not available on all systems) to filter the data prior to summing to memory. Real-time DSP is not compatible with pulse sequences that use explicit acquisition to acquire less than the full number of data points (np) in a single acquire statement (e.g., solids sequences such as BR24 and FLIPFLOP).

If either type is active, the filter bandwidth parameter fb is not active. The actual analog filter *is* active and is automatically set by the software to a value that matches *(*sw/2)*oversamp as closely as possible.

Another type of DSP is available that allows post-processing of data. See the description of the pards macro for details.

Values: 'i' selects inline DSP and calls addpar('oversamp') to create the DSP parameters def_osfilt, filtfile, oscoef, osfb, osfilt, oslsfrq, and oversamp. A value of oversamp greater than 1 causes the next experiment run to be oversampled, digitally filtered, and downsampled back to the selected sw prior to saving it to disk.

'r' selects real-time DSP and calls the macro addpar('oversamp') to create the DSP parameters def_osfilt, filtfile, oscoef, osfb, osfilt, oslsfrq, and oversamp (although only oversamp and osfilt are user adjustable for real-time DSP). Use dsp='r' only if the optional DSP hardware is present in the system. Set fsq='y' to use frequency-shifted quadrature detection.

'n' (or parameter dsp is not present) disables both types of DSP. Set dsp='n' if you wish to turn off DSP on a permanent or semi-permanent basis. To turn off DSP within just a single experiment, set oversamp='n'.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to current experiment (M)
at	Acquisition time (P)
def_osfilt	Default value of osfilt (P)
fb	Filter bandwidth (P)
filtfile	File of FIR digital filter coefficients (P)
fsq	Frequency-shifted quadrature detection (P)
il	Interleave arrayed and 2D experiments (P)
moveossw	Set oversampling parameters for selected spectral region (M)
np	Number of data points (P)
oscoef	Digital filter coefficients for oversampling (P)
osfb	Digital filter bandwidth for oversampling (P)
osfilt	Oversampling filter for real-time DSP (P)
oslsfrq	Bandpass filter offset for oversampling (P)
oversamp	Oversampling factor for acquisition (P)
pards	Create additional parameters used by downsampling (M)
paros	Create additional parameters used by oversampling (M)
ra	Resume acquisition stopped with *sa* command (C)
sa	Stop acquisition (C)
sw	Spectral width in the directly detected dimension (P)

dsplanes — Display a series of 3D planes (M)

Syntax: `dsplanes(start_plane,stop_plane)`

Description: Produces a graphical 2D color or contour map for a subset of 3D planes. The `dconi` program is used to display the planes.

Arguments: `start_plane` specifies the number of the 3D plane with which display is to begin. It must be greater than 0.

`stop_plane` specifies the number of the 3D plane with which the display is to end. If `start_plane` is greater than `stop_plane`, only the first plane, whose number is `start_plane`, is plotted. The range of `stop_plane` depends on the value of the parameter `plane` as follows:

- If `plane='f1f3'`, range of `stop_plane` is between `0` and `fn2/2`
- If `plane='f2f3'`, range of `stop_plane` is between `0` and `fn1/2`
- If `plane='f1f2'`, range of `stop_plane` is between `0` and `fn/2`

Examples: `dsplanes(1,3)`

See also: *NMR Spectroscopy User Guide*

Related:

`dconi`	Interactive 2D data display (C)
`dplane`	Display a 3D plane (M)
`dproj`	Display a 3D plane projection (M)
`getplane`	Extract planes from 3D spectral data set (M)
`nextpl`	Display the next 3D plane (M)
`plane`	Currently displayed 3D plane type (P)
`plplanes`	Plot a series of 3D planes (M)
`prevpl`	Display the previous 3D plane (M)

dsptype — Type of DSP (P)

Description: Indicates the existence of digital signal processing (DSP).

Values: `0` indicates no digital signal processing. `1` indicates DSP exists.

Examples: `dsptype?=0 dsptype?=1`

See also: *NMR Spectroscopy User Guide*

Related:

`dsp`	Type of DSP for data acquisition (P)

dss — Display stacked spectra (C)

Syntax: `dss<(<start,finish<,step>><,options>)>`

Description: Displays one or more spectra on the screen.

The display is not interactive like the command `ds`. Integral display is controlled by the parameter `intmod` when a single spectrum is displayed (see `'int'` option below). The following values are accepted for `intmod`:

- `intmod='off'` turns off the integral display.
- `intmod='full'` displays the entire integral.
- `intmod='partial'` displays every other integral region.

An individual trace is displayed from and arrayed 1D spectra or 2D spectra by supplying the index number as an argument. Spectra from 2D data set are displayed from either the f_1 or f_2 domain by setting the parameter `trace` equal to `'f1'` or `'f2'`, respectively. Enter `ft1d`, `trace='f1'`, and `dss` to view the interferogram. Multiple spectra are displayed by supplying indexes of the first and last spectra.

The position of the first spectrum is governed by the parameters wc, sc, and vp. For 1D data, subsequent spectra are positioned relative to the preceding spectrum by the parameters vo (vertical offset) and ho (horizontal offset). For 2D data, ho defines the total horizontal offset between the first and last spectrum. Also for 2D data, vo is inactive while the parameter wc2 defines the total vertical offset between the first and last spectrum.

The parameter cutoff, if it exists and is active, defines the distance above and below the current vertical position vp at which peaks are truncated. By arraying cutoff to have two different values, the truncation limits above and below the current vertical position can be controlled independently. For example, cutoff=50 truncates peaks at vp+50 mm and vp−50 mm. cutoff=50,10 truncates peaks at vp+50 mm and vp−10 mm.

Arguments: start is the index of the first spectra when displaying multiple spectra. It is also the index number of a particular trace to be viewed when displaying arrayed 1D spectra or 2D spectra.

finish is the index of the last spectra when displaying multiple spectra. Since the parameter arraydim is automatically set to the total number of spectra, it can be used to set finish to include all spectra (e.g., dss(1,arraydim,3)).

step is the increment for the spectral index when displaying multiple spectra. The default is 1.

options can be any of the following:

- 'all' is a keyword to display all of the spectra.
- 'int' is a keyword to display only the integral, independently of the value of the parameter intmod
- 'top' or 'side' are keywords that cause the spectrum to be displayed either above or at the left edge, respectively, of a contour plot. This assumes that the parameters sc, wc, sc2, and wc2 are those used to position the contour plot.
- 'dodc' is a keyword for all spectra to be drift corrected independently.
- 'red', 'green', 'blue', 'cyan', 'magenta', 'yellow', 'black', and 'white' are keywords that select a color.
- 'pen1', 'pen2', 'pen2' … are keywords that pens.
- 'nopars' — prevents the display commands from drawing the parameters at the bottom of the graphics screen.
- 'custom' — uses the parameters shownumx (x position) and shownumy (y position), counting from bottom left of every spectrum.
- 'reverse' — rotate the text by 90° - useful if the arrayed parameter values are long with respect to the width of the individual sub-spectra.
- 'value' —The values of up to two simultaneous arrays are displayed. Diagonal arrays are allowed. The second parameter is shown in different color). The name of the arrayed parameter(s) is also shown. If used on a one-dimensional array representation of a 2D spectrum, ni and phase (in case of phase sensitive 2Ds) parameters are shown.

Examples:
```
dss(1,3)
dss(1,12,3,'green')
```

See also: *NMR Spectroscopy User Guide*

Related:		
	cutoff	Data truncation limit (P)
	dssa	Display stacked spectra automatically (C
	dssan	Display stacked spectra automatically without erasing (C)
	dssh	Display stacked spectra horizontally (C)

dsshn	Display stacked spectra horizontally without erasing (C)
dssn	Display stacked spectra without screen erase (C)
dsww	Display spectra in whitewash mode (C)
ft1d	Fourier transform along f_2 dimension (C)
ho	Horizontal offset (P)
intmod	Integral display mode (P)
pl	Plot spectra (C)
plww	Plot spectra in whitewash mode (C)
sc	Start of chart (P)
sc2	Start of chart in second direction (P)
shownumx	x position counting from bottom left of every spectrum (P)
shownumy	y position counting from bottom left of every spectrum (P)
trace	Mode for 2D data display (P)
vo	Vertical offset (P)
vp	Vertical position of spectrum (P)
wc	Width of chart (P)
wc2	Width of chart in second direction (P)

dssa — Display stacked spectra automatically (C)

Syntax: `dssa<(<start,finish<,step>><,options>)>`

Description: Displays one or more spectra automatically.

Integral display is controlled by the parameter intmod when a single spectrum is displayed (see 'int' option below). The following values are accepted for intmod:

- intmod='off' turns off the integral display.
- intmod='full' displays the entire integral.
- intmod='partial' displays every other integral region.

An individual trace is displayed from and arrayed 1D spectra or 2D spectra by supplying the index number as an argument. Spectra from 2D data set are displayed from either the f_1 or f_2 domain by setting the parameter trace equal to 'f1' or 'f2', respectively. Enter ft1d, trace='f1', and dss to view the interferogram. Multiple spectra are displayed by supplying indexes of the first and last spectra.

The position of the first spectrum is governed by the parameters wc, sc, and vp. For 1D data, subsequent spectra are positioned relative to the preceding spectrum by the parameters vo (vertical offset) and ho (horizontal offset). For 2D data, ho defines the total horizontal offset between the first and last spectrum.

Also for 2D data, vo is inactive while the parameter wc2 defines the total vertical offset between the first and last spectrum. To display spectra "automatically," the command dssa adjusts the parameters vo and ho to fill the screen in a lower left to upper right presentation (wc must be set to less than full screen width for this to work)

The parameter cutoff, if it exists and is active, defines the distance above and below the current vertical position vp at which peaks are truncated. By arraying cutoff to have two different values, the truncation limits above and below the current vertical position can be controlled independently. For example, cutoff=50 truncates peaks at vp+50 mm and vp−50 mm. cutoff=50,10 truncates peaks at vp+50 mm and vp−10 mm.

Arguments: start is the index of the first spectra when displaying multiple spectra. It is also the index number of a particular trace to be viewed when displaying arrayed 1D spectra or 2D spectra.

finish is the index of the last spectra when displaying multiple spectra.

`step` is the increment for the spectral index when displaying multiple spectra. The default is 1.

`options` can be any of the following:

- `'all'` is a keyword to display all of the spectra.
- `'int'` is a keyword to only display the integral, independently of the value of the parameter `intmod`
- `'dodc'` is a keyword for all spectra to be drift corrected independently.
- `'red'`, `'green'`, `'blue'`, `'cyan'`, `'magenta'`, `'yellow'`, `'black'`, and `'white'` are keywords that select a color.
- `'pen1'`, `'pen2'`, `'pen2'` … are keywords that pens.
- `'nopars'` — prevents the display commands from drawing the parameters at the bottom of the graphics screen.

Examples: `dssa(1,3)`

See also: *NMR Spectroscopy User Guide*

Related:

`cutoff`	Data truncation limit (P)
`dss`	Display stacked spectra (C)
`dssan`	Display stacked spectra automatically without erasing (C)
`dssh`	Display stacked spectra horizontally (C)
`dsshn`	Display stacked spectra horizontally without erasing (C)
`dssn`	Display stacked spectra without screen erase (C)
`dsww`	Display spectra in whitewash mode (C)
`ft1d`	Fourier transform along f_2 dimension (C)
`ho`	Horizontal offset (P)
`intmod`	Integral display mode (P)
`pl`	Plot spectra (C)
`plww`	Plot spectra in whitewash mode (C)
`sc`	Start of chart (P)
`sc2`	Start of chart in second direction (P)
`shownumx`	x position counting from bottom left of every spectrum (P)
`shownumy`	y position counting from bottom left of every spectrum (P)
`trace`	Mode for 2D data display (P)
`vo`	Vertical offset (P)
`vp`	Vertical position of spectrum (P)
`wc`	Width of chart (P)
`wc2`	Width of chart in second direction (P)

`dssan` Display stacked spectra automatically without erasing (C)

Syntax: `dssan<(<start,finish<,step>><,options>)>`

Description: Functions the same as the command `dssa` except the graphics window is not erased before starting the display. This allows composite displays of many spectra to be created. The arguments are the same as `dssa`.

Examples: `dssan(1,3)`

See also: *NMR Spectroscopy User Guide*

Related:

`dssa`	Display stacked spectra automatically (C)

`dssh` Display stacked spectra horizontally (C)

Syntax: `dssh<(<start,finish<,step>><,options>)>`

Description: Displays one or more spectra horizontally.

Integral display is controlled by the parameter intmod when a single spectrum is displayed (see 'int' option below). The following values are accepted for intmod:

- intmod='off' turns off the integral display.
- intmod='full' displays the entire integral.
- intmod='partial' displays every other integral region.

An individual trace is displayed from and arrayed 1D spectra or 2D spectra by supplying the index number as an argument. Spectra from 2D data set are displayed from either the f_1 or f_2 domain by setting the parameter trace equal to 'f1' or 'f2', respectively. Enter ft1d, trace='f1', and dss to view the interferogram. Multiple spectra are displayed by supplying indexes of the first and last spectra.

The position of the first spectrum is governed by the parameters wc, sc, and vp. For 1D data, subsequent spectra are positioned relative to the preceding spectrum by the parameters vo (vertical offset) and ho (horizontal offset). For 2D data, ho defines the total horizontal offset between the first and last spectrum. Also for 2D data, vo is inactive while the parameter wc2 defines the total vertical offset between the first and last spectrum. To display spectra horizontally, the command dssh causes vo to be set to zero and for ho, sc, and wc to be adjusted to fill the screen from left to right with the entire array.

The parameter cutoff, if it exists and is active, defines the distance above and below the current vertical position vp at which peaks are truncated. By arraying cutoff to have two different values, the truncation limits above and below the current vertical position may be controlled independently. For example, cutoff=50 truncates peaks at vp+50 mm and vp−50 mm, and cutoff=50,10 truncates peaks at vp+50 mm and vp−10 mm.

Arguments: start is the index of the first spectra when displaying multiple spectra. It is also the index number of a particular trace to be viewed when displaying arrayed 1D spectra or 2D spectra.

finish is the index of the last spectra when displaying multiple spectra.

step is the increment for the spectral index when displaying multiple spectra. The default is 1.

options can be any of the following:

- 'all' is a keyword to display all of the spectra.
- 'int' is a keyword to only display the integral, independently of the value of the parameter intmod
- 'dodc' is a keyword that causes all spectra to be drift corrected independently.
- 'red', 'green', 'blue', 'cyan', 'magenta', 'yellow', 'black', and 'white' are keywords that select a color.
- 'pen1', 'pen2', 'pen2' … are keywords that pens.
- 'nopars' — prevents the display commands from drawing the parameters at the bottom of the graphics screen.

Examples: dssh(1,3)

See also: *NMR Spectroscopy User Guide*

Related:

cutoff	Data truncation limit (P)
dss	Display stacked spectra (C)
dssa	Display stacked spectra automatically (C)
dssan	Display stacked spectra automatically without erasing (C)
dsshn	Display stacked spectra horizontally without erasing (C)
dssn	Display stacked spectra without screen erase (C)

dsww	Display spectra in whitewash mode (C)
ft1d	Fourier transform along f_2 dimension (C)
ho	Horizontal offset (P)
intmod	Integral display mode (P)
pl	Plot spectra (C)
plww	Plot spectra in whitewash mode (C)
sc	Start of chart (P)
sc2	Start of chart in second direction (P)
shownumx	x position counting from bottom left of every spectrum (P)
shownumy	y position counting from bottom left of every spectrum (P)
trace	Mode for 2D data display (P)
vo	Vertical offset (P)
vp	Vertical position of spectrum (P)
wc	Width of chart (P)
wc2	Width of chart in second direction (P)

dsshn — Display stacked spectra horizontally without erasing (C)

Syntax: `dsshn<(<start,finish<,step>><,options>)>`

Description: Functions the same as the command `dssh` except the graphics window is not erased before starting the display. This allows composite displays of many spectra to be created. The arguments are the same as `dssh`.

Examples: `dssh(1,3)`

See also: *NMR Spectroscopy User Guide*

Related:

dssh	Display stacked spectra horizontally (C)

dssl — Label a display of stacked spectra (M)

Syntax: `dssl(<options>)`

Description: Displays a label for each element in a set of stacked spectra. The label is an integer value from 1 up to the number of spectra in the display or the values of parameters up to 2 dimensions.

Labels can appear at incorrect positions if `wysiwyg='n'`. The positions are empirically determined for a large screen display and are not guaranteed to be correct for all displays.

Arguments: `options` control the display (more than one option can be entered as long as the options do not conflict with each other):

- `'center'`, `'left'`, `'right'`, `'top'`, `'bottom'`, `'above'`, and `'below'` are keywords setting the position of the displayed index relative to each spectrum.
- `'custom'` — uses the parameters `shownumx` (x position) and `shownumy` (y position), counting from bottom left of every spectrum.
- `'list=xxx'` produces a display of the values contained in the arrayed parameter `xxx`.
- `'format=yyy'` uses the format `yyy` to control the display of each label. See the `write` command for information about formats.
- `'reverse'` — rotate the text by 90° - useful if the arrayed parameter values are long with respect to the width of the individual sub-spectra.
- `'value'` —The values of up to two simultaneous arrays are displayed. Diagonal arrays are allowed. The second parameter is shown in different color). The name of the arrayed parameter(s) is also shown. If used on a

one-dimensional array representation of a 2D spectrum, `ni` and `phase` (in case of phase sensitive 2Ds) parameters are shown.

Examples:
```
dssl
dssl('top','left')
dssl('value','format=%3.1f') pssl
```

See also: *NMR Spectroscopy User Guide*

Related:

`dss`	Display stacked spectra (C)
`shownumx`	x position counting from bottom left of every spectrum (P)
`shownumy`	y position counting from bottom left of every spectrum (P)
`write`	Write formatted text to a device (C)

dssn — Display stacked spectra without screen erase (C)

Syntax: `dssn<(<start,finish<,step>><,options>)>`

Description: Functions the same as the command `dss` except the graphics window is not erased before starting the display. This allows composite displays of many spectra to be created. The arguments are the same as `dss`.

Examples:
```
dssn(1,3)
```

See also: *NMR Spectroscopy User Guide*

Related:

`dss`	Display stacked spectra (C)

dsvast — Display VAST data in a stacked 1D-NMR matrix format (M)

Applicability: Systems with the VAST accessory.

Syntax: `dsvast<(display order,number of columns displayed)>`

Description: dsvast will arrange and display the traces from a reconstructed 2D data set (see (see `vastglue`)as an array of 1D spectra in a matrix of 1D spectra. If no arguments are provided, the number of rows and columns will be determined by the periodicity of the display order based on the `doneQ`. For example, if a block of 96 spectra (typical for a microtiter-plate) have been acquired using VAST automation, the spectra will be displayed in a matrix 8 rows and 12 columns with the well label using the format [A->H][1->12].

The spectra can be plotted using the macro `plvast`.

Arguments: `display order` is optional and its default value is the glue order as listed in `glueorderarray`. A `display order` can be defined using the `plate_glue` program.

`number of columns displayed`. The default value of is deduced by examining the periodicity of the requested display order. The `number of columns displayed` can entered as the second argument or as the first argument if the default `display order` is used.

Examples:
```
dsvast
dsvast(12)
dsvast('glue_file', 4)
```

See also: *NMR Spectroscopy User Guide*

Related:

`dsast2d`	Display VAST data in a pseudo-2D format (M)
`plvast`	Plot VAST data in a stacked 1D-NMR matrix (M)
`plvast2d`	Plot VAST data in a pseudo-2D format (M)
`plate_glue`	Define a display order (U)

D

dsvast2d — Display VAST data in a pseudo-2D format (M)

Applicability: Systems with the VAST accessory.

Syntax: `dsvast2d(number)`

Description: If an array of 1D spectra have been acquired (in particular if a block of 96 spectra has been acquired using VAST automation, especially in a microtiter-plate format), and if these spectra have been glued into a reconstructed 2D dataset (see `vastglue`), this macro will arrange and display them (on the screen) in a convenient pseudo-2D format (almost like an LC-NMR chromatogram).Well labels are not attached to the spectra and spectra are plotted with 8 spectra per row.

Arguments: The default is to display all the spectra (from 1 through `arraydim`) with 8 columns (spectra) and 12 rows. An optional argument `dsvast2d(number)` allows specifying that only spectra from *1* through *number* should be plotted. The number of spectra displayed is rounded up to the nearest multiple of 8.

Related:		
	`dsast`	Display VAST data in a 1D-NMR matrix format (M)
	`plvast`	Plot VAST data in a stacked 1D-NMR matrix (M)
	`plvast2d`	Plot VAST data in a pseudo-2D format (M)

dsww — Display spectra in whitewash mode (C)

Syntax: `dsww<(<start,finish<,step>><,'int'>)>`

Description: Displays one or more spectra in whitewash mode (after the first spectra, each spectra is blanked out in regions in which it is behind a prior spectra).

Arguments: `start` is the index of the first spectra when displaying multiple spectra. It is also the index number of a particular trace to be viewed when displaying arrayed 1D spectra or 2D spectra; default is to display all spectra.

`finish` is the index of the last spectra when displaying multiple spectra.

`step` is the increment for the spectral index when displaying multiple spectra. The default is 1.

`'int'` is a keyword to display only the integral, independently of the value of the parameter `intmod`

Examples: `dsww(1,3)`

Related:		
	`dss`	Display stacked spectra (C)
	`dssa`	Display stacked spectra automatically (C)
	`dssan`	Display stacked spectra automatically without erasing (C)
	`dssh`	Display stacked spectra horizontally (C)
	`dsshn`	Display stacked spectra horizontally without erasing (C)
	`dssn`	Display stacked spectra without screen erase (C)
	`pl`	Plot spectra (C)
	`plww`	Plot spectra in whitewash mode (C)

dtext — Display a text file in graphics window (M)

Syntax: `dtext<(file,x,y)><:$x_next,$y_next,$increment>`

Description: Displays a text file in the graphics window.

Arguments: `file` is the name of a text file. The default is the current experiment text file.

`x` and `y` are coordinates of the first line of text. This positions the location of the output. The default is the upper left-hand corner of the screen.

`$x_next` and `$y_next` are the coordinates where the start of the next line would have been displayed. This is useful for subsequent character display.

`$increment` is the increment between lines.

Examples:
```
dtext
dtext(userdir+'/exp3/text')
dtext(100,100)
dtext:$x,$y,$dy
```

Related:

`pltext`	Plot a text file (M)
`ptext`	Print out a text file (M)
`text`	Display text or set new text for current experiment (C)
`write`	Write formatted text to a device (C)

`dtrig` Delay to wait for another trigger or acquire a spectrum (P)

Applicability: Systems with LC-NMR accessory.

Description: If `ntrig` is greater than 0 after a trigger is detected, a pulse sequence waits for `dtrig` seconds before either waiting for another trigger or acquiring a spectrum. Typically, after the LC has positioned the sample in the NMR probe and stopped the pump, there is a small time (30 seconds) during which conditions (pressure, etc.) in the NMR probe are still settling; better NMR performance is obtained if an appropriate delay is inserted using `dtrig`. If `dtrig` does not exist, a value of 0 is assumed. If `dtrig` does not exist, the `parlc` macro can create it.

Related:

`ntrig`	Number of trigger signals to wait before acquisition (P)
`parlc`	Create LC-NMR parameters (M)

`dutyc` Duty cycle for homodecoupling (optional) (P)

Applicability: VNMRS systems, 400 MR

Syntax: `dutyc=<value>`

Description: Sets the rf duty cycle fraction (0.0-0.4) for rf on part of homonuclear decoupling. The duty cycle default is 0.1 (or 10% rf on) if the `dutyc` does not exist. Homonuclear decoupling delay before and after the rf on period. `homorof1`, `homorof2`, and `homorof3`, are equivalent to `rof1`, `rof2` and `rof3` and all default to 2 µsec.

Values: 0.0 to 0.4 — default is 0.1

Examples: `dutyc=0.2` sets a 20% duty cycle

Related:

`homo`	Homodecoupling control for observe channel (P)
`hdof`	Frequency offset for homodecoupling (P)
`hdpwr`	Sets the rf attenuator to control the power for homonuclear decoupling (P)
`hdmf`	modulation frequency for the band selective homonuclear decoupling (P)
`hdpwrf`	Sets the rf linear modulator fine power for homonuclear decoupling (P)
`hdres`	Sets the tip angle resolution (P)
`hdseq`	Sets the decoupler waveform filename (P)
`homorof1`	Delay before turning on homo decoupling rf (P)
`homorof2`	Delay after blanking the amplifier and setting T/R switch to receive (P)

homorof3	Delay between setting T/R switch to receive gating on the receiver (P)
tn	Nucleus for observe transmitter (P)

E

e	Eject sample (M)
eaddr	Display Ethernet address (M,U)
ecc_on	Turns on eddy current compensation for Cold Probes (M)
ecc_off	Turns off eddy current compensation for Cold Probes (M)
echo	Display strings and parameter values in text window (C)
edit	Edit a file with user-selectable editor (M)
eject	Eject sample (M)
elist	Display directory on remote VXR-style system (M,U)
email	Email address (P)
enter	Enter sample information for automation run (M,U)
enterdialog	Start a dialog window using enterexp file (M)
eread	Transfer file from remote source (M,U)
ernst	Calculate the Ernst angle pulse (C)
errlog	Display recent error messages (C)
errloglen	Number of lines in error message display (P)
ewrite	Transfer file to remote destination (M,U)
exec	Execute a command (C)
execpars	Set up the exec parameters (M)
execplot	Execute plotting macro (P)
execprep	Execute prepare macro (P)
execprescan	Execute prescan macro (P)
execproc	Execute processing macro (P)
execprocess	Execute processing macro (P)
execsetup	Execute setup macro (P)
exists	Checks if parameter, file, or macro exists and file type (C)
exit	Call the vnmrexit command (M)
exp	Find exponential value of a number (C)
expactive	Determine if experiment has active acquisition (C)
expfit	Make least-squares fit to polynomial or exponential curve (U)
expl	Display exponential or polynomial curves (C)
expladd	Add another diffusion analysis to current display (M)
explib	Display experiment library (M)
explist	Display current experiment chain and approx. time for each (M)
explog	Display log file for experiment (M)
exptime	Display experiment time (C)

e — Eject sample (M)

Description: Ejects the sample from the probe by turning on the eject air and the slow drop air. The e macro functions the same as the eject macro.

See also: *NMR Spectroscopy User Guide*

Related:

`eject`	Eject sample (M)
`i`	Insert sample (M)
`insert`	Insert sample (M)

eaddr — Display Ethernet address (M,U)

Description: Displays the name of the local host and its hardware Ethernet address. The 48-bit address is presented in octal, decimal, and hexadecimal formats.

See also: *NMR Spectroscopy User Guide*

Related:

`dnode`	Display list of valid limNET nodes (M,U)

ecc_on — Turns on eddy current compensation for Cold Probes (M)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Turns on eddy current compensation

Related:

`ecc_off`	Turns off eddy current compensation for Cold Probes (M)

ecc_off — Turns off eddy current compensation for Cold Probes (M)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Turns off eddy current compensation.

Related:

`ecc_on`	Turns on eddy current compensation for Cold Probes (M)

echo — Display strings and parameter values in text window (C)

Syntax: `echo<(<'-n',>string1,string2, ....)>`

Description: Displays strings and parameter values in the text window similar to the UNIX `echo` command.

Arguments: `'-n'` is a keyword that suppresses advancing to the next line. The default is to advance to the next line.

`string1,string2,...` are one or more strings (surrounded with single quote marks) or parameters. The format used for numbers is identical to the `%g` format described for the `write` command.

Examples:

```
echo
echo('This is a string')
echo('Pulse Width is: ',pwr)
echo('-n','No new line')
```

See also: *User Programming*

Related:

`write`	Write formatted text to a device (C)

edit — Edit a file with user-selectable editor (M)

Syntax: `edit(file)`

Description: Opens a file for editing using a text editor. The default editor is `vi`. To select another editor, set the UNIX environmental variable `vnmreditor` to the name of the editor (change the line `setenv vnmreditor old_editor` in `.login` to become `setenv vnmreditor new_editor`, e.g., `setenv vnmreditor emacs`) and make sure a script with the prefix `vnmr_` followed

by the name of the editor (e.g., vnmr_emacs) is placed in the bin subdirectory of the system directory. The script file makes adjustments for the type of graphic interface in use.

Scripts provided with VnmrJ include vnmr_vi and vnmr_textedit. To create other scripts, see the vnmr_vi script for non-window editor interfaces and the vnmr_textedit script for window-based editor interfaces.

Arguments: file is the name of the file you wish to edit.

Examples: edit('myfile')

See also: *User Programming*

Related:

paramedit	Edit a parameter and its attributes with user-selected editor (C)
paramvi	Edit a parameter and its attributes with vi editor (M)
macroedit	Edit a user macro with user-selectable editor (C)
macrovi	Edit a user macro with vi editor (C)
menuvi	Edit a menu with the vi editor (M)
textvi	Edit text file of current experiment with vi editor (M)

eject — Eject sample (M)

Syntax: eject

Description: Ejects the sample from the probe by turning on the eject air and the slow drop air. The e macro functions the same as the e macro.

See also: *NMR Spectroscopy User Guide*

Related:

e	Eject sample (M)
i	Insert sample (M)
insert	Insert sample (M)

elist — Display directory on remote VXR-style system (M,U)

Syntax: elist(remote_node,remote_directory)
(From UNIX) elist remote_node remote_directory

Description: Lists directory contents on a remote VXR-style (Gemini, VXR-4000, or XL) system.

Arguments: remote_node is the name of the remote VXR-style system.

remote_directory is the name of the directory on the remote system.

Examples: elist('gemini','fidlib')
(From UNIX) elist gemini fidlib

See also: *NMR Spectroscopy User Guide*

Related:

dnode	Display list of valid limNET nodes (M,U)

email — Email address (P)

Applicability: *VnmrJ Walkup*

Description: A global parameter set to the email address of an operator. It is used to send an email message to an operator when an experiment or sample is complete. The parameter is set from the operator email field in the VnmrJ Adm interface.

See also: *VnmrJ Installation and Administration, VnmrJ Walkup*

Related:

operatorlogin	Sets workspace and parameters for the operator (M)
prescan	Study queue prescan (P)

E

enter — Enter sample information for automation run (M,U)

Applicability: Systems with an automatic sample changer.

Syntax: `enter<(file<,configuration_file>)>`
(From UNIX) `enter <file> <configuration_file>`

Description: Enables entry of sample information for automation runs, including the sample location, user information, solvent used, experiment or experiments to run, and arbitrary text information. `enter('abc')` creates a directory named `abc`. In this directory is a file named `abc`, which contains experiment information.

Arguments: `file` is the name of the file to be edited. The default is that `enter` prompts for this information. If the file already exists, new entries are appended to it.

`configuration_file` is the name of a user-supplied file that customizes `enter` for local use. Several configuration files are provided:

- `enter.conf` is used when defining an experiment when an automation run is not currently active.
- `auto.conf` is used when defining an experiment for a current automation run. The `walkup` macro is provided for this style of entering samples.
- `gilson.conf` is used with the VAST accessory.

Examples: (From VnmrJ or UNIX) `enter`
(From VnmrJ) `enter('mysamples')`
(From UNIX) `enter MySamples`
(From VnmrJ) `enter('mysamples','auto.conf')`

See also: *NMR Spectroscopy User Guide; User Programming, VnmrJ Walkup*

Related:

`auto`	Set up an automation directory (C)
`autogo`	Start an automation run (C)
`autoname`	Prefix for automation data file (P)
`autora`	Resume a suspended automation run (C)
`autosa`	Suspend current automation run (C)
`printer`	Printer device (P)
`status`	Display status of all experiments (C)
`walkup`	Walkup automation (M)

enterdialog — Start a dialog window using enterexp file (M)

Applicability: Systems with automation.

Syntax: `enterdialog`

Description: Internal macro used by `enter` to start a dialog window using the `enterexp` file in the `dialoglib` directory.

See also: *NMR Spectroscopy User Guide; User Programming, VnmrJ Walkup*

Related:

`enter`	Enter sample information for automation run (M,U)

eread — Transfer file from remote source (M,U)

Applicability: Systems with limNET protocol software installed.

Syntax: (From VnmrJ) `eread(local_file,remote_node,remote_file)`
(From UNIX) `eread local_file remote_node remote_file`

Description: Copies a remote file to the local host. It will not overwrite a preexisting file.

Arguments: `local_file` is the file name of the local host. If `local_file` is not a dot file (i.e., starts with "."), `eread` uses the "I1" and "I2" values of the remote file to create an extension and then append it to the local file name.

`remote_node` is a symbolic node name for a specified node file. Use the command `dnode` to list nodes defined on your system. The names of the remote computers or "nodes" available to the limNET protocol are contained in the file `/vnmr/nodes`. *Note that this is not the same file as the name of the remote computers available to the Internet protocol (IP), which are contained in the file* `/etc/hosts`. Each user only needs to know the "names" of relevant nodes.

`remote_file` is the name of file to be transferred from the remote host.

Examples: (From VnmrJ) `eread('osv700','VXR4000','dsk1.osv700')`
(From UNIX) `eread osv700 VXR4000 dsk1.osv700`

See also: *NMR Spectroscopy User Guide*

Related:

`dnode`	Display list of valid limNET nodes (M,U)
`ewrite`	Transfer file to remote destination (M,U)

ernst — Calculate the Ernst angle pulse (C)

Syntax: `ernst(t1_estimate<,90_pulse_width>)`

Description: Calculates the optimum ("Ernst") pulse width according to the formula

$$pw = \cos^{-1}\left(\exp^{-(at+d1)/t1_estimate}\right) \bullet (pw90/360)$$

The new `pw` value is entered in the parameter table.

Arguments: `t1_estimate` is an estimate of the T_1 for a peak of interest.

`90_pulse_width` is a 90° pulse width determined by the parameter `pw90`. The default is the current value of parameter `pw90` if `pw90` exists.

Examples:
```
ernst(5)
ernst(3,12.6)
```

See also: *NMR Spectroscopy User Guide*

Related:

`pw`	Pulse width (P)
`pw90`	90° pulse width (P)

errlog — Display recent error messages (C)

Description: Displays in the text window the most recent error messages. The global parameter `errloglen` controls the number of lines displayed. If `errloglen` is not defined, `errlog` displays 10 lines by default.

See also: *NMR Spectroscopy User Guide*

Related:

`acqstatus`	Acquisition status (P)
`errloglen`	Number of lines in error message display (P)

errloglen — Number of lines in error message display (P)

Description: Sets the number of lines in the display of error messages by `errlog`.

Values: Integer, default is 10.

See also: *NMR Spectroscopy User Guide*

Related:

`errlog`	Display recent error messages (P)

E

ewrite — Transfer file to remote destination (M,U)

Applicability: Systems with limNET protocol software installed.

Syntax: (From VnmrJ) `ewrite(local_file,remote_node,remote_file)`
(From UNIX) `ewrite local_file remote_node remote_file`

Description: Takes a preexisting local file and copies it to a remote host. The file cannot preexist on the remote host.

Arguments: `local_file` is the file name of the local host.

`remote_node` is a symbolic node name for a specified node file. Use the command dnode to list nodes defined on your system. The names of the remote computers or "nodes" available to the limNET protocol are contained in the file `/vnmr/nodes`. *Note that this is not the same file as the name of the remote computers available to the Internet Protocol (IP), which are contained in the file* `/etc/hosts`. Each user only needs to know the "names" of relevant nodes.

`remote_file` is the name of file to be transferred from the remote host.

Examples: (From VnmrJ) `ewrite('osv700','VXR4000','dsk1.osv700')`
(From UNIX) `ewrite osv700 VXR4000 dsk1.osv700`

See also: *NMR Spectroscopy User Guide*

Related:

dnode	Display list of valid limNET nodes (M,U)
eread	Transfer file from remote source (M,U)

exec — Execute a command (C)

Syntax: `exec(command_string)`

Description: Executes the command given by the string argument.

Arguments: `command_string` is a character string constructed from a macro.

Examples:
```
exec($cmdstr)
exec(parstyle)
```

See also: *User Programming*

execpars — Set up the exec parameters (M)

Description: Set up the exec parameters as listed in `/vnmr/execpars`.

See also: *User Programming*

Related:

apptype	Application type (P)
execplot	Execute plotting macro (P)
execprep	Execute prepare macro (P)
execprescan	Execute prescan macro (p)
execproc	Execute processing macro (P)
execsetup	Execute setup macro (P)

execplot — Execute plotting macro (P)

Description: Defines which plotting macro to use to plot this experiment.

See also: *User Programming*

Related:

apptype	Application type (P)
plot	Automatically plot spectra (M)

execprep **Execute prepare macro (P)**

Description: Defines which prepare macro to use to prescan this experiment.

See also: *User Programming*

Related:

apptype	Application type (P)
acquire	Acquire data (M)
plot	Automatically plot spectra (M)

execprescan **Execute prescan macro (P)**

Description: Defines which prescan macro to use to prescan this experiment.

See also: *User Programming*

Related:

apptype	Application type (P)
acquire	Acquire data (M)

execproc **Execute processing macro (P)**

Description: Defines which processing macro to use to process this experiment.

See also: *User Programming*

Related:

apptype	Application type (P)
acquire	Acquire data (M)

execprocess **Execute processing macro (P)**

Description: Defines which processing macro to use to process this experiment.

See also: *User Programming*

execsetup **Execute setup macro (P)**

Description: Defines which setup macro to use to prescan this experiment.

See also: *User Programming*

Related:

apptype	Application type (P)
cqexp	Load experiment from protocol (M)
sqexp	Load experiment from protocol (M)

exists **Checks if parameter, file, or macro exists and file type (C**

Syntax:
```
exists(name,'keyword'):$res1, $res2
exists(name,'keyword'<,argument>):$res1, $res2
```

Description: Checks for the existence of a parameter, file, command, parameter file, or a macro from within a macro. The command can be used to check if a file is an ASCII text file, a directory, or to search the application directories for a file or directory.

Arguments: `$res1`— results from `exists` are returned to the `$` variable.

`$res2` — optional: returns the absolute path to the file, command, macro, etc. The `exists` command does not pass anything to the optional second argument if it does not find the specified file, command, macro, etc.

`name` — the name of a parameter, file, command, or macro.

keyword	*description and returned values*
'maclib'	Macros reside in applications directories, or appdirs. Typical directories are the users vnmrsys/maclib directory and /vnmr/maclib. The appdirs are searched in order then macros are executed. Exists returns the following to $res1: 0 — if the macro is not found in any of the appdirs 1, 2, or larger integer — indicates it was found in the first, second, third, etc. appdir. Name of any appdir (shapelib, manual, probes, shims) directory or directory within appdir and be used for the keyword maclib.
'command'	The command keyword is similar to the maclib keyword, except that it firsts checks to see if the name represents a built-in Vnmr command. Exists returns the following to $res1: 0 — if the name is neither a built-in command nor a macro. 1 — if the name represents a built-in command. 2, 3, 4, or 5 — if name is a macro.
'ascii'	Checks if the file specified by name is an ASCII text file. Exists returns the following to $res1: 0 — if the file is not an ascii file. 1 — if the file is an ascii file.
'parlib'	Checks for the file specified by name is in parlib using the path defined by applications directories or appdirs for parlib. A .par is appended to the name if it is not found and the search repeated if the file is not found on the first pass. Exists returns the following to $res1: 0 — if the file is not found. 1 — if the file is found. Optional: result returned to $res2. Return the absolute path of the parameter set if it is found.
'psglib'	Checks for the file specified by name is in psglib using the path defined by applications directories or appdirs for psglib. A .c is appended to the name if it is not found and the search repeated if the file is not found on the first pass. Exists returns the following to $res1: 0 — if the file is not found. 1 — if the file is found. Optional: result returned to $res2. Return the absolute path of the file set if it is found.
	The following keywords accept an argument

argument	*description and returned values*
'file'	Checks if the file specified by name exists. Exists returns the following to $res1: 0 — if the file does not exist. 1 — if the file exists.
'perm'	perm is a combination of one or more of the following: r — read w — write e — execute Access permission can be checked by passing one, two, or three characters in a single argument.

keyword		*description and returned values*
'parameter'		Checks if the parameter file specified by name exists. Exists returns the following to $res1: 0 — if the parameter file does not exist. 1 — if the parameter file exists.
	'tree'	tree is one of the following: current (default if no argument is supplied), global, processed, or systemglobal.
'directory'		Checks for the existence of the specified directory in the applications directories. Exists returns the following to $res1: 0 — if the directory does not exist. 1 — if the directory exists.
	'errval'	An error value to return to $res1 if the directory does not exist.

Examples:

```
exists('ni','parameter'):$twod
exists('/vnmr/conpar','file','rw')
exists('wft','command'):$num
```

Using exists from within a macro to search the bin directory in the applications directories for the file myprog and, if found, return the path to the $myprogPath argument:

```
exists($myprog,'bin'):$e,$myprogPath
  if ($e) then
    shell($myprogPath):$res
  else
    write('line3','%s: Program %s has not been
installed',$0,$myprog)
  endif
```

Using exists from within a macro to search for files in the top-level of the appdirs.

```
   exists('pulsecal','')
```

The search for pulsecal starts at the top-level of all appdirs.

Using exists from within a macro to search multi-level directories:

```
     exists(probename,'probes/'+probe)
```

The first argument is set to '' which forces exists to check for directories in the appdirs.

```
exists('nomacro','maclib',-1):$ok
```

Sets $ok to -1 instead of 0 if nomacro does not exist in any of the applications directories. This feature can be applied to interface controls to make a button either not appear or appear grayed out if a macro (or file) does not exist.

See also: *User Programming*

Related:		
	appdirs	Starts Applications Directory Editor (M)
	create	Create new parameter in a parameter tree (C)
	hidecommand	Execute macro instead of command with same name (C)
	which	Display which macro or command is used (M)

E

exit — **Call the vnmrexit command (M)**

Description: Calls the vnmrexit command to exit from VnmrJ. As a macro, exit provides a user some flexibility in defining other things to do when exiting.

CAUTION: **When you exit from the VnmrJ user interface on your X display system, whether you are using an X terminal or a Sun computer, and whether you are using OpenWindows, CDE, or Motif, you must first exit from any copy of VnmrJ running on your system. Failure to do this can cause current parameter values and even current data to be lost.**

exp — **Find exponential value of a number (C)**

Syntax: `exp(value)<:n>`

Description: Finds the exponential value (base *e*) of a number.

Arguments: `value` is a number.

`n` is the return value giving the exponential value of `value`. The default is to display the exponential value in the status window.

Examples:
```
exp(.5)
exp(val):exp_val
```

See also: *User Programming*

Related

atan	Find arc tangent of a number (C)
cos	Find cosine value of an angle (C)
ln	Find natural logarithm of a number (C)
sin	Find sine value of an angle (C)
tan	Find tangent value of an angle (C)

expactive — **Determine if experiment has active acquisition (C)**

Syntax:
(1) `expactive<(exp_number)><:$answer>`
(2) `expactive('auto')<:$mode>`
(3) `expactive('current')<:$exp><,$user>`

Description: Determines whether an acquisition is active or pending in an experiment.

Arguments: `exp_number` is the number, from 1 to 9999, of the experiment to be checked. The default is the current experiment.

`$answer` is a return value: `-1` if an acquisition is not possible (e.g., the system is a data station), `0` if no acquisition active in the requested experiment, `1` if an acquisition active in that experiment, and `2` or larger if an acquisition is queued in the requested experiment (subtract 1 from the value to determine its position in the acquisition queue). With no return argument, the result displays on line 3.

`'auto'` is a keyword to check if the system is in automation mode.

`$mode` is a return value: 1 if the system is in automation mode, or 0 if otherwise. With no return argument, the result is displayed on line 3.

`'current'` is a keyword that determines whether an active experiment has an active acquisition command running. An experiment is still considered active if it holds up additional acquisitions during its `wexp` processing by the `'wait'` flag. If `expactive('current')` does not have a return argument, results are displayed on line 3.

`$exp` is a return value indicating the current active experiment number: –1 if no acquisition is possible, or 0 if no acquisition is active.

`$user` is a return value indicating the user who started the acquisition. If the system is running in automation mode, `$user` is set to “auto.” If no acquisition is running, `$user` is set to “nobody.”

Examples:
```
expactive
expactive(3)
expactive(2):$active
expactive('auto'):$automode
```

expfit — Make least-squares fit to polynomial or exponential curve (U)

Syntax: (From UNIX) `expfit options <analyze.inp >analyze.list`

Description: Makes a least-squares curve fitting to the data supplied in the file `analyze.inp`. For the specialized uses of `analyze`, VnmrJ macros (e.g., `t1`, `t2`, `kind`) are available that provide the correct file format and avoid the need for the user to select options.

In the regression mode, the type of curve fitting, (`'poly1',...`) must be selected. For regression (generalized curve fitting), the regression section in the manual *NMR Spectroscopy User Guide* shows the input file format and describes the menus that permit option choices indirectly through menu buttons.

The following text file is an example of the file `analyze.inp` (for options `T1`, `T2`, `kinetics`, `contact_time`, and `regression`). (1), (2), etc. do not actually appear in the file but are used to identify lines in the description presented below the file.

```
(1)  time
(2)    <amp>
(3)      2   4   linear linear

(4)        NEXT   4
(5)    1
(6)        1   1
           2   4
           3   9
           4   16
(4)        NEXT   3
(5)    2
(6)        2   5
           3   10
           4   17
```

This file contains the following information:

(1) Optional *x*-axis title.

(2) Optional *y*-axis title, for regression only.

(3) Line containing an integer for the number of peaks, followed by another integer for the number of pairs per peak. If regression, the *x*-scale type and *y*-scale type are also listed.

(4) In the regression mode, a line beginning with the keyword NEXT is inserted at the start of each data set when the number of pairs per peak is variable, followed by an integer for the number of pairs for the peak.

(5) An integer that indexes the peaks.

(6) Data pairs, one to a line, listed by peak.

For options `T1`, `T2`, `kinetics`, and `contact_time`, information from the file `fp.out` and from the array `xarray` are used to construct this file; therefore, it is necessary to run `fp` prior to `analyze`. For regression, this file is made by running `expl('regression')`.

For `diffusion`, `contact_time`, and, if not in regression mode, `poly1` and `poly2`, the `analyze.inp` file is slightly different:

```
(1)    List of n x-y data pairs
(2)    <text line>
```

```
(3)   <x-values>  <y-values>
(4)   x  y
      .  .  .
```

(1) Title line.

(2) Descriptive text line.

(3) Number of `x` values and `y` values.

(4) Data pairs, one to a line, are listed by peak in the following order:

```
x  y   (first peak, first pair)
x  y   (first peak, second pair)
...
x  y   (second peak, first pair)
...
```

`expfit` also makes a file `analyze.out` that is used by `expl` to display the results of the analysis in addition to output to the standard output, which is usually directed to `analyze.list`.

Arguments: `options` can be any of the following:

`T1` sets T_1 analysis. This value is the default.

`T2` sets T_2 analysis.

`kinetics` sets kinetics analysis with decreasing peak height.

`increment` sets kinetics analysis with increasing peak height.

`list` sets an extended listing for each peak.

`diffusion` sets a special analysis for diffusion experiments.

`contact_time` sets a special analysis for solids cross-polarization spin-lock experiments.

`regression` sets regression mode, providing generalized curve fitting with choices `poly1`, `poly2`, `poly3`, and `exp`:

- `poly0` calculates the mean.
- `poly1` sets a linear fitting.
- `poly2` sets a quadratic fitting.
- `poly3` sets a cubic curve fitting.
- `exp` sets an exponential curve fitting.

Examples: (From UNIX) `expfit d2 T1 list <analyze.inp >analyze.out`
(From UNIX) `expfit regression exp list <analyze.inp >analyze.out`

See also: *NMR Spectroscopy User Guide*

Related:

`analyze`	Generalized curve fitting (C)
`expl`	Display exponential or polynomial curves (C)
`fp`	Find peak heights (C)
`kind`	Kinetics analysis, decreasing intensity (M)
`t1`	T_1 exponential analysis (M)
`t2`	T_2 exponential analysis (M)

`expl` Display exponential or polynomial curves (C)

Syntax: `expl<(<options,>line1,line2,...)>`

Description: Displays exponential curves resulting from T_1, T_2, or kinetic analyses. Also displays polynomial curves from diffusion or other types of analysis. The parameters `sc`, `wc`, `sc2`, and `wc2` control the size of the display.

In general, the first time expl is displayed, it calculates appropriate limits for the two axes. A subsequent call to expl, while a previous expl is displayed on the graphics screen, uses the axis scaling that displayed expl. To have the new expl recalculate its own axis limits and not use those currently displayed, call the autoscale macro before executing expl. Alternately, the axis limit for the expl display can be specified using the scalelimits macro.

Arguments: options can be any of the following:

- 'regression' is a keyword signifying the beginning of generalized curve fitting. expl displays the data in the file regression.inp as unconnected points and also uses regression.inp to create the file analyze.inp, which serves as input to analyze for curve fitting.
- 'linear', 'square', and 'log' are keywords for display of the data points against a square or logarithmic axis scale, with the exception of the results from regression. The first keyword controls the *x*-axis scale, the second the *y*-axis. The default is 'linear'.
- 'link' is a keyword to link the data points rather than a display of the theoretical curve.
- 'nocurve' is a keyword to produce a plot of data points only.
- 'tinysymbol' is a keyword to display small-scale data point symbols.
- 'nosymbol' is a keyword to produce a plot of the curve only.
- 'noclear' is a keyword to not erase the graphics screen before drawing the plot. This prevents the graphics screen from being cleared of data.
- 'oldbox' is a keyword to plot an additional curve on an existing plot. Only the first data set in the file analyze.out is plotted. The box and scale description is derived from the file expl.out in the current experiment. When the 'oldbox' option is used, a second argument is necessary to identify the curve number and data point symbol to represent the data. This second argument is a number from 1 to 6.
- 'file' is a keyword that, when followed by a file name, makes that file replace the file analyze.out as the input to expl.

line1, line2,... specify the curves to be displayed. The default is to display the first eight curves (if that many exist) along with data points.

Examples:
```
expl
expl(1,3,6)
expl('oldbox',5)
expl('regression')
expl('regression',4,5)
```

See also: *NMR Spectroscopy User Guide*

Related:

analyze	Generalized curve fitting (C)
autoscale	Resume autoscaling after limits set by scalelimits (M)
expfit	Make least squares fit to polynomial or exponential curve (C)
pexpl	Plot exponential or polynomial curves (C)
sc	Start of chart (P)
sc2	Start of chart in second direction (P)
scalelimits	Set limits for scales in regression (M)
wc	Width of chart (P)
wc2	Width of chart in second direction (P)

expladd — Add another diffusion analysis to current display (M)

Applicability: Systems with the diffusion option.

Syntax: `expladd(integral_region)`

Description: Adds results of another diffusion analysis to the currently displayed results.

Arguments: `integral_region` specifies the number of the region whose results are to be added to the existing graph.

Examples: `expladd(1)`

See also: *NMR Spectroscopy User Guide*

Related:

`expl`	Display exponential or polynomial curves (C)
`pexpl`	Plot exponential or polynomial curves (C)
`pexpladd`	Add another diffusion analysis to current plot (M)

explib — Display experiment library (M)

Description: Displays the currently available experiment files. For each experiment, `explib` displays the name of the experiment and its subexperiments, whether an acquisition is active or its position in the acquisition queue, the current size of the experiments, the pulse sequence currently active in the experiments, and the first 50 characters of the text file in the experiment. `explib` also displays a message if the system is in automation mode.

See also: *NMR Spectroscopy User Guide*; *VnmrJ Walkup*

explist — Display current experiment chain and approx. time for each (M)

See also: Displays approximate time for each experiment in a chained experiment.

Related:

`autotime`	Display approximate time for automation (M)

explog — Display log file for experiment (M)

Description: Displays the log file for an experiment. This file includes when the experiment started, any acquisition errors that may have occurred, and when the experiment finished. Each acquisition generates this information, which is stored in the experiment's `acqfil` directory in a text file named `log`.

See also: *NMR Spectroscopy User Guide*

exptime — Display experiment time (C)

Syntax: `exptime<(sequence)><:$seconds>`

Description: Estimates the acquisition time for an experiment, based on the parameters used in the current experiment, and displays the time in the format `hh:mm:ss`. The `time` macro uses `exptime` to determine the time of an experiment.

Arguments: `sequence` is a pulse sequence that exists in the `seqlib` directory. If this argument is used, `exptime` estimates the acquisition time for the specified sequence. The default is the current value of `seqlib`.

`$seconds` is a return argument with the number of seconds estimated for the experiment. If this argument is used, the time display is suppressed.

Examples:

```
exptime
exptime('apt')
exptime:$etime
exptime('noesy'):$est_time
```

See also: *NMR Spectroscopy User Guide*

Related:

`time`	Display experiment time or recalculate number of transients (M)

F

f	Set display parameters to full spectrum (C)
f19	Automated fluorine acquisition (M)
f19p	Process 1D fluorine spectra (M)
f1coef	Coefficient to construct F1 interferogram (P)
f2coef	Coefficient to construct F2 interferogram (P)
fattn	Fine attenuator (P)
fb	Filter bandwidth (P)
fbc	Apply baseline correction for each spectrum in an array (M)
fdm1	Set, write 1D FDM parameters, run FDM (M)
fiddc3d	3D time-domain dc correction (P)
fiddle	Perform reference deconvolution (M)
fiddled	Perform reference deconvolution subtracting alternate FIDs (C)
fiddleu	Perform reference deconvolution subtracting successive FIDs (C)
fiddle2d	Perform 2D reference deconvolution (C)
fiddle2D	Perform 2D reference deconvolution (C)
fiddle2dd	2D reference deconvolution subtracting alternate FIDs (C)
fiddle2Dd	2D reference deconvolution subtracting alternate FIDs (C)
fidmax	Find the maximum point in an FID (C)
fidpar	Add parameters for FID display in current experiment (M)
fidsave	Save data (M)
fifolpsize	FIFO loop size (P)
file	File name of parameter set (P)
files	Interactively handle files (C)
filesinfo	Return file information for files display (C)
filtfile	File of FIR digital filter coefficients (P)
findxmlmenu	Find an xml menu (M)
fitspec	Perform spectrum deconvolution (C, U)
fixgrd	Convert gauss/cm value to DAC (M)
fixpar	Correct parameter characteristics in experiment (M)
fixpar3rf	Create parameters for third rf channel (M)
fixpar4rf	Create parameters for fourth rf channel (M)
fixpar5rf	Create parameters for fifth rf channel (M)
fixup	Adjust parameter values selected by setup macros (M)
fixpsg	Update psg libraries (M)
flashc	Convert compressed 2D data to standard 2D format (C)
flipflop	Set up parameters for FLIPFLOP pulse sequence (M)
Fluorine	Set up parameters for 19F experiment (M)
flush	Write out data in memory (C)
fn	Fourier number in directly detected dimension (P)
fn1	Fourier number in 1st indirectly detected dimension (P)
fn2	Fourier number in 2nd indirectly detected dimension (P)
fn2D	Fourier number to build up 2D DOSY display in freq. domain (P)
focus	Send keyboard focus to input window (C)

F

foldcc	Fold INADEQUATE data about two-quantum axis (C)
foldj	Fold J-resolved 2D spectrum about f_1=0 axis (C)
foldt	Fold COSY-like spectrum along diagonal axis (C)
fontselect	Open FontSelect window (C)
format	Format a real number or convert a string for output (C)
fp	Find peak heights or phases (C)
fpmult	First point multiplier for np FID data (P)
fpmult1	First point multiplier for ni interferogram data (P)
fpmult2	First point multiplier for ni2 interferogram data (P)
fr	Full recall of a display parameter set (M)
fread	Read parameters from file and load them into a tree (C)
fsave	Save parameters from a tree to a file (C)
fsq	Frequency-shifted quadrature detection (P)
ft	Fourier transform 1D data (C)
ft1d	Fourier transform along f_2 dimension (C)
ft1da	Fourier transform phase-sensitive data (M)
ft1dac	Combine arrayed 2D FID matrices (M)
ft2d	Fourier transform 2D data (C)
ft2da	Fourier transform phase-sensitive data (M)
ft2dac	Combine arrayed 2D FID matrices (M)
ft3d	Perform a 3D Fourier transform on a 3D FID data set (M,U)
full	Set display limits for a full screen (C)
fullsq	Display largest square 2D display (M)
fullt	Set display limits for a full screen with room for traces (C)

f — Set display parameters to full spectrum (C)

Description: Sets up the sp and wp display parameters for a full display of a 1D spectrum. If an FID is displayed, the parameters sf and wf are set for a full display. In multidimensional data sets, the parameters for both displayed dimensions are set up. For 2D data sets, the parameters sp, wp, sp1, and wp1 would be set. For planes of higher dimensional data sets, the appropriate two groups of sp-wp, sp1-wp1, and sp2-wp2, parameter pairs are set.

See also: *NMR Spectroscopy User Guide*

Related:

sf	Start of FID (P)
sp	Start of plot in directly detected dimension (P)
sp1	Start of plot in 1st indirectly detected dimension (P)
sp2	Start of plot in 2nd indirectly detected dimension (P)
wf	Width of FID (P)
wp	Width of plot in directly detected dimension (P)
wp1	Width of plot in 1st indirectly detected dimension (P)
wp2	Width of plot in 2nd indirectly detected dimension (P)

f19 — Automated fluorine acquisition (M)

Syntax: `f19<(solvent)>`

Description: Prepares parameters for automatically acquiring a standard ^{19}F spectrum. The parameter wexp is set to `'procplot'` for standard processing. If `f19` is used as the command for automation via the enter program, then the macro au is

supplied automatically and should not be entered on the MACRO line of the `enter` program. However, it is possible to customize the standard `f19` macro on the MACRO line by following it with additional commands and parameters. For example, `f19 nt=1` uses the standard `f19` setup but with only one transient.

Arguments: `solvent` is the name of the solvent. In automation mode, the solvent is supplied by the `enter` program. The default is `'CDCl3'`

Examples:
```
f19
f19('DMSO')
```

See also: *NMR Spectroscopy User Guide*

Related:

`au`	Submit experiment to acquisition and process data (M)
`enter`	Enter sample information for automation run (C)
`f19p`	Process 1D fluorine spectra (M)
`proc1d`	Processing macro for simple (non-arrayed) 1D spectra (M)
`procplot`	Automatically process FIDs (M)
`wexp`	When experiment completes (P)

`f19p` Process 1D fluorine spectra (M)

Description: Processes non-arrayed 1D fluorine spectra using a set of standard macros. `f19p` is called by `proc1d`, but can also be used directly. Fully automatic processing (up to a point where a spectrum could be plotted) is provided: Fourier transformation (using preset weighting functions), automatic phasing (`aphx` macro), select integral regions (`hregions` macro), adjust integral size (`integrate` macro), vertical scale adjustment (`vsadjc` macro), avoiding excessive noise (`noislm` macro), threshold adjustment (if required, `thadj` macro), and referencing to the TMS signal, if present (`tmsref` macro).

See also: *NMR Spectroscopy User Guide*

Related:

`aphx`	Perform optimized automatic phasing (M)
`f19`	Automated fluorine acquisition (M)
`hregions`	Select integral regions for proton spectra (M)
`integrate`	Automatically integrate 1D spectrum (M)
`noislm`	Avoids excessive noise (M)
`proc1d`	Processing macro for simple (non-arrayed) 1D spectra (M)
`thadj`	Adjust threshold (M)
`tmsref`	Reference spectrum to TMS line (M)
`vsadjh`	Adjust vertical scale for proton spectra (M)

`f1coef` Coefficient to construct F1 interferogram (P)

Description: Holds the coefficient to construct an F1 interferogram for 2D and 3D transformation. Coefficients are used by the `ft2da` and `ft3d` macros. If `f1coef` has a null value, `ft2da` uses the “standard” coefficients. `f1coef` is created by the `par2d` macro.

Values: Series of coefficients, separated by spaces (not a comma), and stored as a string variable. For example, the coefficient for standard States-Hypercomplex data set is `f1coef='1 0 0 0 0 0 -1 0'`.

See also: *NMR Spectroscopy User Guide*

Related:

`f2coef`	Coefficient to construct F2 interferogram (P)
`ft2da`	Fourier transform phase-sensitive data (M)
`ft3d`	Perform a 3D Fourier transform on a 3D FID data set (M,U)

make3dcoef	Make 3D coefficients file from 2D coefficients (M)
par2d	Create 2D acquisition, processing, display parameters (M)

f2coef — Coefficient to construct F2 interferogram (P)

Description: Holds the coefficient to construct an F2 interferogram for 2D and 3D transformation. Coefficients are used by the ft2da('ni2') and ft3d macros. If f2coef has a null value, ft2da('ni2') uses the "standard" coefficients. f2coef is created by the par3d macro.

Values: Series of coefficients, separated by spaces (not a comma), and stored as a string variable. For example, the coefficient for standard States-Hypercomplex data set is f2coef='1 0 0 0 0 0 -1 0'.

fattn — Fine attenuator (P)

Description: Configuration parameter for whether the current rf channel has a fine attenuator. The value is set using the label Fine Attenuator in the Spectrometer Configuration window (opened from config).

Values: 0 specifies the fine attenuator is not present on the channel (Not Present choice in Spectrometer Configuration window).

4095 specifies the fine attenuator is present on the channel (Present choice in Spectrometer Configuration window).

See also: *VnmrJ Installation and Administration; User Guide: Solids; CP/MAS Installation*

Related:		
	config	Display current configuration and possibly change it (M)
	dpwrf	First decoupler fine power (P)
	tpwrf	Observe transmitter fine power (P)

fb — Filter bandwidth (P)

Description: Sets the bandwidth of the audio filters, which prevents noise of higher frequency than the spectral limits from "folding in" to the spectrum. Because the transmitter is in the center of the spectrum, the range of audio frequencies that must be filtered out is half the spectral width sw (e.g., for a spectral width of 4000 Hz, frequencies higher than ±2000 Hz should be filtered out). The audio filters have some attenuation at frequencies lower than their nominal cutoff frequency, which is the frequency at which signals have been attenuated by 3 dB (50%). This impacts on quantitative accuracy near the edges of the spectrum so that the standard value of fb is 10% more than half of sw.

fb is automatically changed whenever the spectral width sw is changed and thus is normally not a user-entered parameter. For example, typing sw=4000 automatically sets fb=2200, which is 10% more than 2000 Hz. After changing the value of sw, fb can be changed.

Values: if sw is 500,000 or less: 1000 to 256000 Hz, 1000-Hz steps.

if sw is greater than 500,000: 256 kHz, 1 MHz.

See also: *NMR Spectroscopy User Guide*

Related:		
	sw	Spectral width in directly detected dimension (P)
	mrfb	Set the filter bandwidths for multiple receivers (P)

fbc — Apply baseline correction for each spectrum in an array (M)

Description: Applies `bc` -type baseline correction to all the spectra in an array. The partial integral mode should be used to set integral regions to include all significant signals, while leaving blank as large an area of baseline as is possible.

See also: *NMR Spectroscopy User Guide*

Related: `dosy` Process DOSY experiments (M)

fdm1 — Set, write 1D FDM parameters, run FDM (M)

Syntax: `fdm1<(filename<,n1, v1<, n2, v2<...>>>)>`
or
`fdm1 (i)` for the i-th trace

Description: Sets 1D Filter Diagonalization Method (FDM) parameters to the default values, writes the parameters to the `curexp/datdir/fdm1.inparm` file, and runs a stand-alone C++ program (`/vnmr/bin/fdm1d`).

Arguments: `filename` is the FID file; the default is `curexp+'acqfil/fid'`.

`n1, n2...` is one or more following variable names (the order is arbitrary):

`axis`	–1 (default) to reverse the spec.
`cheat`	No cheat if `cheat=1`, lines are narrower if `cheat<1`.
`cheatmore`	No cheatmore if `cheatmore=0`.
`error`	Error threshold for throwing away poles.
`fidfmt`	FID format: VnmrJ or ASCII.
`fdm`	1 for FDM; –1 for Digital or Discrete Fourier Transform.
`fn_Sp1D`	Spectrum file; default is `curexp/datadir/fdm1.parm`.
`Gamm`	Smoothing width (line broadening).
`Gcut`	Maximum width for a pole.
`idat`	Data type of ASCII FID file –4 for complex data, ignored if data is in VnmrJ format.
`i_fid`	The i-th trace of the FID.
`kcoef`	If `kcoef > 0`, use `'complicated' dk(k). -1` is always preferred.
`Nb`	Number of basis functions in a single window.
`Nbc`	Number of coarse basis vectors.
`Npower`	Number of spectrum data points.
`Nsig`	Number of points to use.
`Nskip`	Number of points to skip.
`par`	Line list file; default is `curexp/datadir/fdm1.parm`
`rho`	`rho=1` is optimal.
`specfmt`	Spec format: VnmrJ or ASCII.
`spectyp`	Spectrum type: complex (default), real imag, or abs.
`ssw`	A test parameter.
`t0`	Delay of the first point.
`theta`	Overall phase of FID (rp in radians).
`wmax`	Maximum spectrum frequency in hertz.
`wmin`	Minimum spectrum frequency in hertz.

`v1, v2...` is the value for the variable(s).

Examples:
```
fdm1('cheat',0.8)
fdm1('Nsig',3000,'Nb',20,1'Gamm',0.5)
```

See also: *NMR Spectroscopy User Guide*

fiddc3d — 3D time-domain dc correction (P)

Description: Sets whether a 3D time-domain dc correction occurs. If `fiddc3d` does not exist, it is created by the macro `par3d`. The time-domain dc correction occurs immediately after any linear prediction operations and before all other operations on time-domain data.

Values: A three-character string. The default value is `'nnn'`.

- The first character refers to the f_3 dimension (`sw`, `np`, `fn`), the second character refers to the f_1 dimension (`sw1`, `ni`, `fn1`), and the third character refers to the f_2 dimension (`sw2`, `ni2`, `fn2`).
- Each character may take one of two values: `'n'` for no time-domain dc correction along the relevant dimension, and `'y'` for time-domain dc correction along the relevant dimension.

See also: *NMR Spectroscopy User Guide*

Related:

`fn`	Fourier number in directly detected dimension (P)
`fn1`	Fourier number in 1st indirectly detected dimension (P)
`fn2`	Fourier number in 2nd indirectly detected dimension (P)
`ft3d`	Perform a 3D Fourier transform (M)
`ni`	Number of increments in 1st indirectly detected dimension (P)
`ni2`	Number of increments in 2nd indirectly detected dimension (P)
`np`	Number of data points (P)
`par3d`	Create 3D acquisition, processing, display parameters (C)
`ptspec3d`	Region-selective 3D processing (P)
`specdc3d`	3D spectral dc correction (P)
`sw`	Spectral width in directly detected dimension (P)
`sw1`	Spectral width in 1st indirectly detected dimension (P)
`sw2`	Spectral width in 2nd indirectly detected dimension (P)

fiddle — Perform reference deconvolution (M)

Syntax:
```
fiddle(option<,file><,option<,file>><,start>
   <,finish><,increment>)
```

Description: Performs reference deconvolution using a reference signal with known characteristics to correct instrumental errors in experimental 1D or 2D spectra.

Arguments: `option` can be any of the following:

- `'alternate'` is a keyword specifying the alternate reference phase +- (for phase sensitive gradient 2D data).
- `'autophase'` is a keyword specifying to automatically adjust the phase of the reference signal.
- `'displaycf'` is a keyword specifying to stop at the display of the correction function.
- `'fittedbaseline'` is a keyword specifying to use cubic spline baseline correction defined by the choice of integral regions.
- `'invert'` is a keyword specifying to invert the corrected difference spectrum/spectra.

- 'noaph' is a keyword specifying not to automatically adjust zero order phase of the reference region.
- 'nodc' is a keyword specifying not to use dc correction of reference region.
- 'noextrap'is a keyword specifying not to use extrapolated dispersion mode.
- 'nohilbert' is a keyword specifying not to use Hilbert transform algorithm and to use extrapolated dispersion mode reference signal unless 'noextrap' is also used as an option.
- 'normalise' is a keyword specifying to keep corrected spectrum integrals equal to that of the first spectrum.
- 'satellites' is a keyword specifying to use satellites defined in file in ideal reference region; file should be in /vnmr/satellites, and should immediately follow 'satellites' in the argument list.
- 'stop1' is a keyword specifying to stop at display of experimental reference FID.
- 'stop2' is a keyword specifying to stop at display of correction function.
- 'stop3' is a keyword specifying to stop at display of corrected FID.
- 'stop4' is a keyword specifying to stop at display of first corrected FID.
- 'verbose' is a specifying keyword to display information about processing in the main window.
- 'writecf' is a keyword specifying to write the correction function to file; the argument file must immediately follow 'writecf'.
- 'writefid' is a keyword specifying to write out corrected FID to file; if file does not begin with /, it is assumed to be in the current working directory. In the argument list, file should immediately follow 'writefid'.

file is the name of the file used with the 'satellites' and 'writefid' options.

start and finish are the indices of the first and last array elements to be processed. increment specifies the steps in which the index is to be incremented. The default is to process all the transformed spectra in an array.

See also: *NMR Spectroscopy User Guide*

Related:

fiddled	Perform reference deconvolution subtracting alternate FIDs
fiddleu	Perform reference deconvolution subtracting successive FIDs
fiddle2d	Perform 2D reference deconvolution
fiddle2D	Perform 2D reference deconvolution
fiddle2dd	Perform 2D reference deconvolution subtracting alternate FIDs
fiddle2Dd	Perform 2D reference deconvolution subtracting alternate FIDs

fiddled — Perform reference deconvolution subtracting alternate FIDs (C)

Description: Produces the corrected difference between successive spectra. Refer to the description of fiddle for details.

See also: *NMR Spectroscopy User Guide*

Related:

fiddle	Perform reference deconvolution

F

fiddleu — **Perform reference deconvolution subtracting successive FIDs (C)**

Description: Produces corrected differences between successive FIDs and the first FID. Refer to the description of `fiddle` for details.

See also: *NMR Spectroscopy User Guide*

Related: `fiddle` Perform reference deconvolution

fiddle2d — **Perform 2D reference deconvolution (C)**

Description: Functions the same as the `fiddle` program except `fiddle2d` performs 2D reference deconvolution. Refer to the description of `fiddle` for details.

See also: *NMR Spectroscopy User Guide*

Related: `fiddle` Perform reference deconvolution

fiddle2D — **Perform 2D reference deconvolution (C)**

Description: Functions the same as the `fiddle` program except `fiddle2D` performs 2D reference deconvolution. Refer to the description of `fiddle` for details.

See also: *NMR Spectroscopy User Guide*

Related: `fiddle` Perform reference deconvolution

fiddle2dd — **2D reference deconvolution subtracting alternate FIDs (C)**

Description: Functions the same as the `fiddle` program except `fiddle2dd` performs 2D reference deconvolution. Refer to the description of `fiddle` for details.

See also: *NMR Spectroscopy User Guide*

Related: `fiddle` Perform reference deconvolution

fiddle2Dd — **2D reference deconvolution subtracting alternate FIDs (C)**

Description: Functions the same as the `fiddle` program except `fiddle2Dd` performs 2D reference deconvolution. Refer to the description of `fiddle` for details.

See also: *NMR Spectroscopy User Guide*

Related: `fiddle` Perform reference deconvolution

fidmax — **Find the maximum point in an FID (C)**

Applicability: All

Syntax:
```
fidmax<(trace)>:$max
fidmax:$max
fidmax(1):$max
fidmax(arraydim):$max
```

Description: `fidmax` finds the absolute maximum value in an FID.

Arguments: No arguments — `fidmax` uses the currently active FID

FID selected by `df` or `select`.

A FID index supplied as an argument.

fidpar — Add parameters for FID display in current experiment (M)

Description: Creates the FID display parameters axisf, crf, deltaf, dotflag, vpf, and vpfi in the current experiment. Use fidpar to define these parameters in old parameter sets (they are already defined in new parameter sets).

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to current experiment (M)
axisf	Axis label for FID displays and plots (P)
crf	Current time domain cursor position (P)
deltaf	Difference of two time cursors (P)
dotflag	Display FID as connected dots (P)
vpf	Current vertical position of FID (P)
vpfi	Current vertical position of imaginary FID (P)

fidsave — Save data (M)

Description: Macro to save data. It uses svfdir and svfname to construct the data filename.

fifolpsize — FIFO loop size (P)

Description: Configuration parameter for the size of the FIFO loop. The size depends on which controller board is present on the system—the Output board, the Acquisition Controller board, or the Pulse Sequence Controller board (refer to the description of the acquire statement in the manual *User Programming* for information on identifying the boards). The value is set using the label Fifo Loop Size in the Spectrometer Configuration window (opened by config).

Values: 2048

See also: *VnmrJ Installation and Administration*

Related:

config	Display current configuration and possibly change it (M)

file — File name of parameter set (P)

Description: Contains the file name of the parameter set returned by a rt or rtp command. This parameter is reset when the go command is issued. If the system is not in automation mode (auto='n'), file is reset to the 'exp' value. If the system is in automation mode (auto='y'), file is set to the path of the directory where the data is stored.

See also: *NMR Spectroscopy User Guide*

Related:

auto	Automation mode active (P)
go	Submit experiment to acquisition (C)
rt	Retrieve FID (C)
rtp	Retrieve parameters (C)

files — Interactively handle files (C)

Syntax: files<(files_menu)>

Description: Brings up the interactive file handling program. With this program, the mouse and keyboard are used to copy, delete, rename, change directories, and load and save experiment data. The files command uses the graphics window to display file names. A mouse clicked on a file name selects it and the file name is displayed in reverse video. Various operations can be conducted on one or more selected files. The menus used for the files program are placed in the

standard menulib directories. Refer to the manual *NMR Spectroscopy User Guide* for more information on using menus, and refer to the manual *User Programming* for information on programming menus.

Arguments: files_menu is the files menu to control the menu buttons; the default menu is 'files_main' or the last active files menu.

Examples:
```
files
files('files_dir')
```

See also: *User Programming*

Related:

filesinfo	Return files display information (C)
tape	Control tape options of files program (P)

filesinfo — Return file information for files display (C)

Syntax:
(1) filesinfo('number'):$number_files
(2) filesinfo('name'<,file_number>):$file
(3) filesinfo('redisplay')

Description: Allows access to the list of files selected from the files interactive display. filesinfo is normally used only by the macros that implement the menu functions of the file system and not entered from the keyboard. The command will not execute unless the files program is active.

Arguments: 'number' is a keyword to return the number of files selected in the files display, or 0 if no files have been selected.

$number_files is the return variable when 'number' is used.

'name' is a keyword to return a list of file names selected in the files display.

file_number is a number following the 'name' keyword to return only the file name in the list given by file_number.

$file is a string variable that returns the file name when 'name' is used.

'redisplay' is a keyword that causes the current contents of the directory to be displayed. This display is useful after making changes in the directory, such as deleting or creating a file.

See also: *User Programming*

Related:

files	Interactively handle files (C)

filtfile — File of FIR digital filter coefficients (P)

Description: Specifies name of a file of FIR (finite impulse response) digital filter coefficients. This file is a text file with one real filter coefficient per line (complex filters are not supported). If the parameter filtfile does not exist in the current experiment, enter addpar('downsamp') or addpar('oversamp') to add it. Entering addpar('downsamp') creates the digital filtering and downsampling parameters downsamp, dscoef, dsfb, dslsfrq, and filtfile. Similarly, entering addpar('oversamp') creates digital filtering and oversampling parameters def_osfilt, filtfile, oscoef, osfb, osfilt, oslsfrq, and oversamp.

Values: File name. The file must be in the user's vnmrsys/filtlib directory.

Related:

addpar	Add selected parameters to current experiment (M)
def_osfilt	Default value of osfilt (P)
downsamp	Downsampling factor applied after digital filtering (P)

dscoef	Digital filter coefficients for downsampling (P)
dsfb	Digital filter bandwidth for downsampling (P)
dslsfrq	Bandpass filter offset for downsampling (P)
oscoef	Digital filter coefficients for oversampling (P)
osfb	Digital filter bandwidth for oversampling (P)
osfilt	Oversampling filter for real-time DSP (P)
oslsfrq	Bandpass filter offset for oversampling (P)
oversamp	Oversampling factor for acquisition (P)
pards	Create additional parameters used for downsampling (M)
paros	Create additional parameters used for oversampling (M)

findxmlmenu Find an xml menu (M)

Description: Find an xml menu. Used by the menu system to find and display VnmrJ menus.

fitspec Perform spectrum deconvolution (C, U)

Syntax: (From VnmrJ) `fitspec<(<'usell'><,><'setsfreq'>)>`
(From UNIX) `fitspec`

Description: Fits experimental data to Lorentzian and/or Gaussian lineshapes. `fitspec` uses as a starting point data in a file `fitspec.inpar`, which must be prepared prior to performing the calculation. This file contains the frequency, intensity, linewidth, and (optionally) the Gaussian fraction of the lineshape. Any number followed by an asterisk (*) is held fixed during the calculation; all other parameters are varied to obtain the best fit. `fitspec` creates a file `fitspec.data`, which is a text representation of the spectral data (that part of the spectrum between `sp` and `sp`+`wp`). After the calculation is finished, the results of the fit are contained in a file `fitspec.outpar`, with a format identical to `fitspec.inpar`.

It is often useful to use the output from a deconvolution as the input to a spin simulation to ensure the most accurate possible frequencies for the spin simulation calculation. For this reason, the frequencies and amplitudes of the calculated lines in a deconvolution are automatically stored in the parameters `slfreq`, respectively, from where they can serve as input to an iterative spin simulation. If the spin system is defined *after* a deconvolution is performed, this information is lost (`slfreq` is reset). In this case, `fitspec('setslfreq')` can be used to copy the information from `fitspec.outpar` back into `slfreq`. This is not necessary if you define the spin system before performing the deconvolution (you need not perform the entire spin simulation, only define the spin system).

Arguments: `'usell'` is a keyword to prepare the file `fitspec.inpar` from the last line listing (stored in `llfrq` and `llamp`). All lines are set to have a linewidth of `slw` and a fixed Gaussian fraction of 0. If another starting point is desired, this file can be edited with a text editor. Alternatively, the macro `usemark` may be used.

`'setslfreq'` is a keyword to copy the information from the file `fitspec.outpar` back into the parameters `slfreq`.

Examples:
```
fitspec
fitspec('usell')
fitspec('setslfreq')
```

See also: *NMR Spectroscopy User Guide*

Related:		
	llamp	List of line amplitudes (P)
	llfrq	List of line frequencies (P)
	setgauss	Set a Gaussian fraction for lineshape (M)

slfreq	Measured line frequencies (P)
sp	Start of plot (P)
usemark	Use “mark” output as deconvolution starting point (M)
wp	Width of plot (P)

fixgrd — Convert gauss/cm value to DAC (M)

Syntax: `fixgrd(gradient_value):parameter`

Description: Uses the gcal value in the probe table to return the DAC value for a specified gradient strength.

Arguments: `gradient_value` is the required gradient strength in gauss/cm.

`parameter` is any local variable or VnmrJ variable.

Examples: `fixgrd(20):gzlvl`

Related:

gcal	Gradient calibration constant (P)

fixpar — Correct parameter characteristics in experiment (M)

Description: After bringing parameters into the current experiment with convert, rt, rtp, or rtv, `fixpar` is automatically executed. `fixpar` updates old parameter characteristics and reconciles parameter differences due to the hardware on the spectrometer. If a macro userfixpar exists, `fixpar` runs it also. This allows an easy mechanism to customize parameter sets.

Related:

convert	Convert data set from a VXR-style system (C)
fixpar3rf	Create parameters for third rf channel (M)
fixpar4rf	Create parameters for fourth rf channel (M)
parfix	Update parameter set (M)
parversion	Version of parameter set (P)
rt	Retrieve FIDs (C)
rtp	Retrieve parameters (C)
rtv	Retrieve individual parameters (C)
updatepars	Update all parameter sets saved in a directory (M)
userfixpar	Macro called by `fixpar` (M)

fixpar3rf — Create parameters for third rf channel (M)

Applicability: Systems with a second decoupler.

Description: Checks for the existence of all acquisition parameters related to the second decoupler. Any parameters found to be absent are created, characterized, and initialized by the macro. `fixpar3rf` is run as a part of the standard fixpar macro if the system configuration parameter numrfch is greater than 2 (i.e., the number of rf channels on the system is set at 3 or more).

fixpar4rf — Create parameters for fourth rf channel (M)

Applicability: Systems with a third decoupler.

Description: Checks for the existence of all acquisition parameters related to the third decoupler. Any parameters found to be absent are created, characterized, and initialized. `fixpar4rf` is run as a part of the standard fixpar macro if the system configuration parameter numrfch is greater than 3 (i.e., the number of rf channels on the system is set at 4).

fixpar5rf **Create parameters for fifth rf channel (M)**

Applicability: Systems with a deuterium decoupler channel as the fourth decoupler.

Description: Checks for the existence of all acquisition parameters related to the fourth decoupler. Any parameters found to be absent are created, characterized, and initialized. `fixpar5rf` is run as a part of the standard `fixpar` macro if the system configuration parameter `numrfch` is greater than 4 (i.e., the number of rf channels on the system is set at 5).

fixup **Adjust parameter values selected by setup macros (M)**

Description: Called by the experiment setup macros `h1`, `c13`, `hc`, `hcapt`, `capt`, and `hcosy`. As provided, the text of `fixup` is all in quotes so that it does nothing. It is intended to provide each user with a mechanism to make adjustments to values selected by the setup macros.

fixpsg **Update psg libraries (M)**

Description: Used by `patchinstall` to recompile the psg files and create new psg libraries `libpsglib.so` in `/vnmr/lib`.

flashc **Convert compressed 2D data to standard 2D format (C)**

Syntax: `flashc(<'nf'>,'ms'|'mi'|'rare',ns,traces,echoes)`

Description: Converts 2D FID data files from compressed formats (`seqcon='nncsn'`, `seqcon='nccnn'`, `seqcon='nnccn'`) to standard format (`seqcon='ncsnn'`) or from standard format to compressed format. Compressed data is taken by using the `nf` parameter; that is, compressed data is acquired as one large uninterrupted "multiFID" acquisition.

`flashc` reads the file `fid` in the `acqfil` subdirectory of the current experiment.

`flashc` can convert a compressed-compressed multislice, multiecho, or multi-image sequence. It can also convert a "rare" type sequence with a compressed phase-encode echo train.

`flashc` changes the values of the following parameters:

Compressed-compressed or standard format to compressed format

- `ni` is set to 1 if no argument is provided.
- `nf` is set to the value of `nf` divided by the multislice, `ms`, or multi-image, `mi`, value.
- `arraydim` is set to the product of its original value and the value of the `traces` argument.
- `arrayelemts` is set to 1 if no parameters were arrayed during data acquisition or to 2 if any parameter was arrayed during data acquisition.

Compressed format to standard format

- `nf` is set to the value of the `traces` argument, or to 1 if no argument is provided.
- `ni` is set to the value of `nf` divided by the multislice, `ms`, or multi-image, `mi`, value.
- `arraydim` is set to the product of its original value and the original value of `nf`.
- `arrayelemts` is set to 1 if no parameters were arrayed during data acquisition or to 2 if any parameter was arrayed during data acquisition.

Arguments: `nf` is the number of FIDs in the second dimension of a 2D experiment. When converting data in the standard format to a compressed format, `nf` must always be the first argument.

When converting compressed-compressed or "rare" type sequences, the first argument must be a string defining the type of compression:

- `'mi'` is a keyword for the multi-image type of compression.
- `'ms'` is a keyword for the multislice type of compression.
- `'rare'` is a keyword for the "rare" multiecho, rare type, fast-imaging data sets.

(Standard to compressed) `ns` is the number of images slices or array elements to be retained.

(Compressed-compressed or rare to standard) `traces` is the number of compressed traces to retain for each `ni`. The parameter `nf` is set to this number after `flashc` has run.

(Compressed-compressed or rare to standard) `echoes` is the number of compressed echoes, used with "rare" type formatting.

Examples: *Compressed-compressed or standard format to compressed format*
`flashc('nf')` (standard to compressed)
`flashc('nf','ms',ns)` (compressed phase-encode and multislice)
`flashc('nf','mi',ns)` (compressed multi-image and phase-encode)

Compressed-compressed format or rare format to standard format
`flashc` (simple compressed phase-encode)
`flashc('ms',ns)` (compressed phase-encode and multislice)
`flashc('mi',ns)` (compressed multi-image and phase-encode)
`flashc('rare',ns,etl)`

See also: *VnmrJ Imaging NMR*

Related:

`arraydim`	Dimension of experiment (P)
`ft2d`	Fourier transform 2D data (C)
`ft3d`	Fourier transform 3D data (C)
`nf`	Number of FIDs (P)
`ni`	Number of increments in 1st indirectly detected dimension (P)

`flipflop` Set up parameters for FLIPFLOP pulse sequence (M)

Applicability: Systems with solids module.

Description: Sets up a multipulse parameter set for tuning out "phase glitch" in the probe and pulse amplifier.

See also: *User Guide: Solid-State NMR*

`Fluorine` Set up parameters for 19F experiment (M)

Description: Set Up parameters for ^{19}F experiment.

`flush` Write out data in memory (C)

Description: Writes out the current data and parameters in memory buffers. Normally, this information is not written to disk until exiting VnmrJ or joining another experiment. One reason to use `flush` is to be able to access experimental data from a program separate from the VnmrJ program.

See also: *User Programming*

fn — Fourier number in directly detected dimension (P)

Description: Selects the Fourier number for the Fourier transformation along the directly detected dimension. This dimension is often referred to as the f_2 dimension in 2D data sets, the f_3 dimension in 3D data sets, etc.

Values: `'n'` or a number equal to a power of 2 (minimum is 32). If `fn` is not *entered* exactly as a power of 2, it is automatically rounded to the nearest higher power of 2 (e.g., setting `fn=32000` gives `fn=32768`). `fn` can be less than, equal to, or greater than `np`, the number of directly detected data points:

- If `fn` is less than `np`, only `fn` points are transformed.
- If `fn` is greater than `np`, `fn` minus `np` zeros are added to the data table ("zero-filling").
- If `fn='n'`, `fn` is automatically set to the power of 2 greater than or equal to `np`.

fn1 — Fourier number in 1st indirectly detected dimension (P)

Description: Selects the Fourier number for the Fourier transformation along the first indirectly detected dimension. This dimension is often referred to as the f_1 dimension of a multi-dimensional data set. The number of increments along this dimension is controlled by the parameter `ni`.

Values: `fn1` is set in a manner analogous to the parameter `fn`, with `np` being substituted by `2*ni`.

See also: *NMR Spectroscopy User Guide*

Related:		
	`fn`	Fourier number in directly detected dimension (P)
	`fn2`	Fourier number in 2nd indirectly detected dimension (P)
	`ni`	Number of increments in 1st indirectly detected dimension (P)
	`np`	Number of data points (P)

fn2 — Fourier number in 2nd indirectly detected dimension (P)

Description: Selects the Fourier number for the Fourier transformation along the second indirectly detected dimension. This dimension is often referred to as the f_2 dimension of a multidimensional data set. The number of increments along this dimension is controlled by the parameter `ni2`. `fn2` is set in a manner analogous to the parameter `fn`, with `np` being substituted by `2*ni2`.

See also: *NMR Spectroscopy User Guide*

Related:		
	`fn`	Fourier number in directly detected dimension (P)
	`fn1`	Fourier number in 1st indirectly detected dimension (P)
	`ni2`	Number of increments in 2nd indirectly detected dimension (P)
	`np`	Number of data points (P)

fn2D — Fourier number to build up 2D DOSY display in freq. domain (P)

Description: In 2D DOSY sequences (Dbppste, DgcsteSL, Doneshot, Dbppsteinept), replaces `fn` when setting up the 2D display.

See also: *NMR Spectroscopy User Guide*

Related:		
	`ddif`	Synthesize and display DOSY plot (C)
	`dosy`	Process DOSY experiments (M)

F

focus — Send keyboard focus to input window (C)

Description: Sends keyboard focus to the input window. This is only useful for macro programming.

See also: *User Programming*

foldcc — Fold INADEQUATE data about two-quantum axis (C)

Syntax: `foldcc`

Description: Symmetrizes 2D INADEQUATE data along the P-type double-quantum axis and applies an automatic `dc` baseline correction. `foldcc` functions for both hypercomplex and complex 2D data.

See also: *NMR Spectroscopy User Guide*

Related:

`dc`	Calculate spectral drift correction (C)
`foldj`	Fold J-resolved 2D spectrum about f_1=0 axis (C)
`foldt`	Fold COSY-like spectrum along diagonal axis (C)
`rotate`	Rotate 2D data (C)

foldj — Fold J-resolved 2D spectrum about f_1=0 axis (C)

Description: Symmetrizes heteronuclear 2D-J, or rotated homonuclear 2D-J, experiments about the f_1=0 axis. The `foldj` command functions with both complex and hypercomplex 2D data.

Related:

`foldcc`	Fold INADEQUATE data about 2-quantum axis (C)
`foldt`	Fold COSY-like spectrum along diagonal axis (C)
`rotate`	Rotate 2D data (C)

foldt — Fold COSY-like spectrum along diagonal axis (C)

Syntax: `foldt<('symm'|'triang')>`

Description: Folds COSY-like correlation spectra about the diagonal. The 2D spectrum must exhibit a *P-type diagonal* for `foldt` to work properly (a P-type diagonal goes from the bottom left-hand side to the top right-hand side of the contour display.) `foldt` functions for both hypercomplex and complex 2D data but requires that `fn`=`fn1` and `sw`=`sw1`.

Arguments: `'symm'` is a keyword for the folding process to perform a symmetrization of the data by replacing every two symmetry-related points with the one point therein that has the least magnitude. This value is the default.

`'triang'` is a keyword for the folding process to perform a triangularization of the data by replacing every two symmetry-related points with their geometric mean.

Related:

`fn`	Fourier number in directly detected dimension (P)
`fn1`	Fourier number in 1st indirectly detected dimension (P)
`foldcc`	Fold INADEQUATE data about 2-quantum axis (C)
`foldj`	Fold J-resolved 2D spectrum about f_1=0 axis (C)
`rotate`	Rotate 2D data (C)
`sw`	Spectral width in directly detected dimension (P)
`sw1`	Spectral width in 1st indirectly detected dimension (P)

fontselect — Open FontSelect window (C)

Description: Opens the FontSelect window for defining fonts in window panes created by setgrid. A different font can be selected for every window pane combination of rows and columns. Separate fonts can also be selected for a large or small overall graphic window.

See also: *NMR Spectroscopy User Guide*

Related:

curwin	Current window (P)
jwin	Activate current window (M)
mapwin	List of experiment numbers (P)
setgrid	Activate selected window (M)
setwin	Activate selected window (C)

format — Format a real number or convert a string for output (C)

Applicability: All

Syntax:
```
format(realvar,'length','precision'):$rval
format(stringvar,'isreal'):$rval
format(stringvar,<'upper' or 'lower'>):$sval
```

Description: Give the command these arguments to format the output as a real number. Accepts arguments specifying the real number length, precision, and output variable. The realvar input must be a real number, string holding a real number, or a string variable that satisfies the rules for a real number.

Give the command two arguments, stringvar and isreal to test the string. The command returns a 1 if the first argument can represent a real number and a 0 if it cannot. The output is written to the specified output variable.

Give the command two arguments, stringvar and either 'upper' or 'lower' to write the string to the output string variable (e.g., $sval) in either all upper case or all lower case. The temporary $ parameter (e.g., $sval) must first be initialized as a string (e.g., $sval='').

Arguments:
realvar a real variable
stringvar a string variable
length of the real number
precision of the real number
$sval a temporary string $ parameter
$rval a temporary real $ parameter

Examples:

```
format(a,5,2):sa
```
If a=24.1264 then string sa='24.13'

```
format(solvent,'lower'):n1
```
If solvent='CDCl3' then string n1='cdcl3'

```
format($1,'isreal'):$a
```
Sets $a to 1 if $1 represents a number or Sets $a to 0 if $1 represents a string.

```
$sval=''
```
Initialize $sval to a string variable to return the value into a string

```
$snum = '143.92'
```

```
$rnum = 32.75
```

```
format($rnum,3,1):$sval
```
sets $sval to the string '32.8'., $sval is a string return value.

```
format($rnum,3,1):$rval
```
sets $rval to the number 32.8. $rval is a real return value.

Format string value $snum = '143.92'

format($snum,3,1):$sval sets $sval to the string '143.9'

`format($snum,3,1):$rval` sets `$rval` to the number `143.9`

See also: *User Programming*

Related:

`n1,n2,n3`	Name storage for macros (P)
`r1–r7`	Real-value storage for macros (P)

fp — Find peak heights or phases (C)

Syntax: `fp<(<'phase',><index1,index2,...>)>`

Description: Following a line listing (either `dll` or `nll`), `fp` measures the peak height of each peak in an array of spectra. The results of the analysis are written to a text file `fp.out` in the current experiment directory. If the `npoint` parameter is defined in the current parameter set and this parameter is "on," it determines the range of data points over which a maximum is searched when determining peak heights. The possible values of `npoint` are `1` to `fn/4`. The default is `2`.

Arguments: `'phase'` is a keyword to measure the phase of each peak instead of height.

`index1,index2,...` restricts measuring peak heights or phases to the lines listed.

Examples:

```
fp
fp(1,3)
fp('phase')
```

See also: *NMR Spectroscopy User Guide*

Related:

`dll`	Display listed line frequencies and intensities (C)
`fn`	Fourier number in directly detected dimension (P)
`getll`	Get line frequency and intensity from line list (C)
`nl`	Position cursor at the nearest line (C)
`nll`	Find line frequencies and intensities (C)
`npoint`	Number of points for `fp` peak search (P)

fpmult — First point multiplier for np FID data (P)

Description: Allows error correction if the first point of an FID is misadjusted. In a 1D experiment, this adjustment influences the overall integral of the spectrum. For *n*-dimensional experiments, if the correction is not made, "ridges" can appear. In 2D experiments, the ridges appear as "f_2 ridges." In 3D experiments, the ridges appear as "f_3 ridges." These ridges can clearly be seen in the noise region on the top and bottom of a 2D spectrum (when `trace='f1'`) as a low-intensity profile of the diagonal. The sign and intensity of the ridges is controlled by the magnitude of `fpmult`.

It has been recognized that the first point of a FID that is sampled at exactly time equal to zero must be multiplied by 0.5 for the Fourier transform to function properly. The `fpmult` parameter gives you a method to fine-tune the actual correction factor.

Values: Default is 1.0, except that if the processing involves backward extension of the time-domain data with linear prediction, the default changes to 0.5. If `fpmult` is set to `'n'`, `fpmult` takes on its default value.

See also: *NMR Spectroscopy User Guide*

Related:

`fpmult1`	First point multiplier for `ni` interferogram data (P)
`fpmult2`	First point multiplier for `ni2` interferogram data (P)
`np`	Number of data points (P)
`trace`	Mode for *n*-dimensional data display (P)
`wft2da`	Weight and Fourier transform phase-sensitive data (M)

fpmult1 — First point multiplier for ni interferogram data (P)

Description: Operates on ni hypercomplex or complex interferogram data in a manner analogous to fpmult. In many 2D experiments, the t_1 values are adjusted so there is no first-order phasing in the f_1 and f_2 dimensions. In this case, fpmult1 should be 0.5. If the t_1 value is adjusted so that there is a 180° first-order phase correction, fpmult1 should be 1.0.

Values: Default value is 0.5. If fpmult1 is set to 'n', it takes on its default value.

See also: *NMR Spectroscopy User Guide*

Related:

fpmult	First point multiplier for np FID data (P)
fpmult2	First point multiplier for ni2 interferogram data (P)
ni	Number of increments in 1st indirectly detected dimension (P)

fpmult2 — First point multiplier for ni2 interferogram data (P)

Description: Operates on ni2 hypercomplex or complex interferogram data in a manner analogous to fpmult. In many 3D experiments, the t_2 value is adjusted so that there is no first-order phasing in the f_1 and f_2 dimensions. In this case, fpmult2 should be 0.5. If the t_2 value is adjusted so that there is a 180° first-order phase correction, fpmult2 should be 1.0.

Values: Default value is 0.5. If fpmult2 is set to 'n', it takes on its default value.

See also: *NMR Spectroscopy User Guide*

Related:

fpmult	First point multiplier for np FID data (P)
fpmult1	First point multiplier for ni interferogram data (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)

fr — Full recall of a display parameter set (M)

Applicability: All

Syntax: fr(n<,noupdate>)

Description: Recall all the parameters of the specified display parameter set and set the current display parameters to those values.

Arguments: n=1 to 9

noupdate as second argument prevents the automatic update of interactive programs.

Related:

r	Recall display parameter set (M)
s	Save display parameters as a set (M)

fread — Read parameters from file and load them into a tree (C)

Syntax: fread(file<,tree<,'reset|'value'>>)

Description: Reads parameters from a file and loads the parameters into a tree. The tree can be global, current, processed, or system global. fread can read from any file that has parameters stored in the correct VnmrJ format.

Note that if parameters are read into the global tree, certain important system parameters are not loaded because these parameters should not be changed. The parameters that are not loaded are userdir, systemdir, curexp, autodir, auto, vnmraddr, and acqaddr.

Arguments: file is the name of the file containing parameters stored in VnmrJ format.

tree is one of the keywords 'global', 'current', 'processed', or 'systemglobal'. The default is 'current'. This argument specifies the

type of tree into which the parameters are loaded. Refer to the create command for more information on types of trees.

'reset' is a keyword that causes the parameter tree to be cleared before the new parameter file is read. Without this option, parameters read from a file are added to the existing preloaded parameters. To use this option, tree must also be specified.

'value' is a keyword that causes only the values of the parameters in the file to be loaded. If a preloaded variable does not already exist, a new one is not created. Parameter attributes are not changed, and enumerated values are not changed. To use this option, tree must also be specified.

Examples:
```
fread('/vnmr/stdpar/H1.par/procpar')
fread('sampvar','global')
fread('setvar','current','reset')
fread('var1','processed','value')
```

See also: *User Programming*

Related:

auto	Automation mode active (P)
autodir	Automation directory absolute path (P)
create	Create new parameter in a parameter tree (C)
curexp	Current experiment directory (P)
destroy	Destroy a parameter (C)
display	Display parameters and their attributes (C)
fsave	Save parameters from a tree to a file (C)
rtp	Retrieve parameters (C)
systemdir	System directory (P)
userdir	User directory (P)

fsave — Save parameters from a tree to a file (C)

Syntax: `fsave(file<,tree>)`

Description: Writes parameters from a parameter tree to a file.

Arguments: file is the name of the file, which can be any valid file for which the user has write permission. If the file already exists, it will be overwritten.

tree is one of the keywords 'global', 'current', 'processed', or 'systemglobal'. The default is 'current'. Refer to the create command for more information on types of trees.

Examples:
```
fsave('var1')
fsave('sampvar','global')
```

See also: *User Programming*

Related:

create	Create new parameter in a parameter tree (C)
destroy	Destroy a parameter (C)
display	Display parameters and their attributes (C)
fread	Read parameters from file and load them into a tree (C)
svp	Save parameters from current experiment (C)

fsq — Frequency-shifted quadrature detection (P)

Description: Selects whether to use frequency-shifted quadrature detection. When fsq is turned on, if dsp is on, the observe frequency is offset by oslsfrq, and the digital filter is also offset by oslsfrq. The default value of oslsfrq is 1.25*sw.

The effect of fsq is to offset only the digital filter by oslsfrq. The observe frequency must be offset by oslsfrq by modifying the pulse sequence as described in the manual *NMR Spectroscopy User Guide*.

Values: 'n' turns frequency-shifted quadrature detection off. 'y' turns it on.

See also: *NMR Spectroscopy User Guide*

Related:

dsp	Type of DSP for data acquisition (P)
oslsfrq	Bandpass filter offset for oversampling (P)
oversamp	Oversampling factor for acquisition (P)
sw	Spectral width in directly detected dimension (P)

ft — Fourier transform 1D data (C)

Syntax: (1) ft<(<options,><'nf'><,start><,finish><,step>)>
(2) ft('inverse',exp_number,expansion_factor)

Description: In syntax 1, performs a Fourier transform on one or more 1D FIDs without weighting applied to the FID. ft executes a left-shift, zero-order phase rotation, and a frequency shift (first-order phase rotation) according to the parameters lsfid, phfid, and lsfrq, respectively, on the time-domain data, prior to Fourier transformation. The type of Fourier transform to be performed is determined by the parameter proc. Solvent suppression is turned on or off with the parameters ssfilter and ssorder. For arrayed data sets, ft Fourier transforms all of the array elements. To Fourier transform selected array elements, ft can be passed numeric arguments.

In syntax 2, ft performs an inverse Fourier transform of the entire spectrum. (VnmrJ does not currently support inverse Fourier transformation of arrayed 1D or 2D data sets.)

Arguments: options can be any of the following (all string arguments must precede the numeric arguments):

- 'acq' is a keyword to check if any elements of a multi-FID experiment have already been transformed. If so, these previously transformed elements will not be retransformed.
- 'dodc' is a keyword for all spectra to be drift corrected independently.
- 'nodc' is a keyword to not perform the usual FID drift correction.
- 'nods' is a keyword to prevent an automatic spectral display (ds) from occurring. This outcome is useful for various plotting macros.
- 'noft' is a keyword to skip the Fourier transform, thereby allowing use of all spectral manipulation and plotting commands on FIDs.
- 'zero' is a keyword to zero the imaginary channel of the FID prior to the Fourier transform. This zeroing occurs after any FID phasing. Its use is generally limited to wideline solids applications.

'nf' is a keyword that makes a single FID element containing nf traces to be transformed as if it were nf separate FID elements. If 'nf' precedes the list of numeric arguments, the rules for interpreting the numeric arguments change slightly. Passing no numeric arguments results in the transformation of all nf traces in the first FID element. Passing a single numeric argument results in the transformation of all nf traces in the requested FID element (e.g., ft('nf',3) transforms all nf traces for element 3). Regardless of the requested FID element, the resulting spectra are labeled as 1 to nf because multiple elements cannot be transformed using ft('nf'). Subsequent numeric arguments are interpreted as previously described.

start is the index of a particular element to be transformed. For an array, start is the index of the first element to be transformed.

finish is the index of the last element to be transformed for an array.

step specifies the increment between successive elements that are to be transformed for an array. The default is 1.

'inverse' is a keyword specifying an inverse Fourier transform.

exp_number is the number of the experiment, from 1 to 9, for storing the resulting FID from the inverse Fourier transform.

expansion_factor defines the expansion of the spectrum before the inverse Fourier transform is performed. This argument is equivalent to a multiplier for the fn parameter. The multiplier is restricted to between 1 and 32 and is rounded up internally to the nearest power of 2.

Examples:
```
ft
ft(1)
ft(3,7)
ft(2,10,2)
ft('nf',3)
```

See also: *NMR Spectroscopy User Guide*

Related:

dcrmv	Remove dc offsets from FIDs in special cases (P)
fn	Fourier number in directly detected dimension (P)
lsfid	Number of points to left-shift the np FID (P)
lsfrq	Frequency shift of the fn spectrum in Hz (P)
nf	Number of FIDs (P)
phfid	Zero-order phasing constant for np FID (P)
proc	Type of processing on the np FID (P)
ssfilter	Full bandwidth of digital filter to yield a filtered FID (P)
ssorder	Order of polynomial to fit digitally filtered FID (P)
wft	Weight and Fourier transform 1D data (C)

ft1d — Fourier transform along f_2 dimension (C)

Syntax:
(1) ft1d(element_number)
(2) ft1d<('nf',element_number)
(3) ft1d<(<options,><coefficients>)>

Description: Performs the first Fourier transformation along the f_2 dimension, without weighting, and matrix transposition. ft1d allows the display of t_1 interferograms with the dcon and dconi commands. For arrayed 2D FID data, a single array element can be weighted and transformed using syntax 1 or 2. The keyword 'nf' is used in syntax 2 to specify that the 2D data is collected in the compressed form using 'nf'. Complex and hypercomplex interferograms can be constructed explicitly by supplying a series of options and coefficients using syntax 3.

For information on real as opposed to complex Fourier transforms, see the descriptions of the proc, proc1, and proc2 parameters. For information about Hadamard transforms, see the description of the proc1 parameter and the *VnmrJ NMR Liquids* user guide. For information on left-shifting, zero-order phase rotation, and frequency shifting of the FID and interferogram time-domain data during the 2D Fourier transformation, see the descriptions of the parameters lsfid, lsfid1, lsfid2, phfid, phfid1, phfid2, lsfrq, lsfrq1, and lsfrq2, as appropriate. For information on the lfs (low-frequency suppression) and zfs (zero-frequency suppression) solvent suppression options, see the description of the parameters ssfilter and ssorder, and the macro parfidss.

Arguments: element_number is a single array element to be weighted and transformed.

options can be the keywords 'ptype' or 'ntype' but neither serve a useful function because the differential effect of these arguments is applied only during the course of the second Fourier transformation. The default is 'ntype'.

`coefficients` are a series of coefficients according to the following scheme: `RR1` is the coefficient used to multiply the real part (first `R`) of spectra set 1 before it is added to the real part (second `R`) of the interferogram. `IR2` would thus represent the contribution from the imaginary part of spectra set 2 to the real part of the interferogram, and so on. The scheme is depicted below.

```
ft1d(RR1,IR1,RR2,IR2,...,RI1,II1,RI2,II2,...)
```

where:

```
RR1*REAL(w2,element=1) ->  REAL(t1)
IR1*IMAG(w2,element=1) -> + REAL(t1)
RR2*REAL(w2,element=2) -> + REAL(t1)
IR2*IMAG(w2,element=2) -> + REAL(t1)
. . .
RI1*REAL(w2,element=1) ->  IMAG(t1)
II1*IMAG(w2,element=1) -> + IMAG(t1)
RI2*REAL(w2,element=2) -> + IMAG(t1)
II2*IMAG(w2,element=2) -> + IMAG(t1)
...
```

See also: *NMR Spectroscopy User Guide*

Related:

`dconi`	Interactive 2D data display (C)
`ft2d`	Fourier transform 2D data (C)
`lsfid`	Number of complex points to left-shift `np` FID (P)
`lsfid1`	Number of complex points to left-shift `ni` interferogram (P)
`lsfid2`	Number of complex points to left-shift `ni2` interferogram (P)
`lsfrq`	Frequency shift of the `fn` spectrum (P)
`lsfrq1`	Frequency shift of the `fn1` spectrum (P)
`lsfrq2`	Frequency shift of the `fn2` spectrum (P)
`parfidss`	Create parameters for time-domain solvent subtraction (M)
`phfid`	Zero-order phasing constant for `np` FID (P)
`phfid1`	Zero-order phasing constant for `ni` interferogram (P)
`phfid2`	Zero-order phasing constant for `ni` interferogram (P)
`proc`	Type of processing on `np` FID (P)
`proc1`	Type of processing on `ni` interferogram (P)
`proc2`	Type of processing on `ni2` interferogram (P)
`pmode`	Processing mode for 2D data (P)
`ssorder`	Order of polynomial to fit digitally filtered FID (P)
`ssfilter`	Full bandwidth of digital filter to yield a filtered FID (P)
`wft2d`	Weight and Fourier transform 2D data (C)

`ft1da` Fourier transform phase-sensitive data (M)

Syntax: `ft1da<(options)>`

Description: Performs the first (f_2) transform of a 2D transform or the first part of a 3D transform. Otherwise, `ft1da` has the same functionality as the `ft2da` command. See the description of `ft2da` for further information. For information about Hadamard transforms, see the description of the `proc1` parameter and the *VnmrJ NMR Liquids* user guide.

Arguments: `options` are the same as used with `ft2da`. See `ft2da` for details.

See also: *NMR Spectroscopy User Guide*

Related:

`ft2d`	Fourier transform 2D data (C)
`ft2da`	Fourier transform phase-sensitive data (M)
`wft1da`	Weight and Fourier transform phase-sensitive data (M)
`wft2da`	Weight and Fourier transform phase-sensitive data (M)

F

ft1dac — Combine arrayed 2D FID matrices (M)

Syntax: `ft1dac<(<mult1><,mult2>,...<,multn>)>`

Description: Allows ready combination of 2D FID matrices within the framework of the 2D Fourier transformation program. No weighting is performed. `ft1dac` requires that the data be acquired either without f_1 quadrature or with f_1 quadrature using the TPPI method. This macro is used for TOCSY (with multiple mixing times).

Arguments: `mult1,mult2,...,multn` are multiplicative coefficients. The `n`th argument is a real number and specifies the multiplicative coefficient for the `n`th 2D FID matrix.

Related:

`ft2dac`	Combine arrayed 2D FID matrices (M)
`Tocsy`	Set up parameters for TOCSY pulse sequence (M)
`wft1da`	Weight and Fourier transform phase-sensitive data (M)
`wft1dac`	Combine arrayed 2D FID matrices (M)

ft2d — Fourier transform 2D data (C)

Syntax:
(1) `ft2d(array_element)`
(2) `ft2d('nf'<array_element>)`
(3) `ft2d<(<options,><plane_number,><coefficients>)>`
(4) `ft2d('ni'|'ni2',element_number,increment)`
(5) `ft2d('ni'|'ni2',increment,<coefficients>)`

Description: Performs the complete 2D Fourier transformation, without weighting, in both dimensions. If the first Fourier transformation has already been done using `ft1d`, `wft1d`, `ft1da`, or `wft1da`, the `ft2d` command performs only the second (t_1) transform.

For arrayed 2D FID data, a single array element can be weighted and transformed using syntax 1. If the data is collected in "compressed" form using `'nf'`, syntax 2 must be used. Complex and hypercomplex interferograms can be constructed explicitly by supplying a series of coefficients using syntax 3. If an arrayed 3D data set is to be selectively processed, the format of the arguments to `ft2d` changes to syntax 4. For example, `ft2d('ni',1,2)` performs a 2D transform along `np` and `ni` of the second `ni2` increment and the first element within the explicit array. This command yields a 2D `np`–`ni` frequency plane.

Arrayed 3D data sets can also be subjected to 2D processing to yield 2D absorptive spectra. If the States-Haberkorn method is used along both f_1 (`ni` dimension) and f_2 (`ni2` dimension), there are generally 4 spectra per (`ni`,`ni2`) 3D element. In this case, using syntax 5, entering `ft2d('ni2',2,<16 coefficients>)` performs a 2D transform along `np` and `ni2` of the second `ni` increment using the 16 coefficients to construct the 2D t_1-interferogram from appropriate combinations of the 4 spectra per (`ni`,`ni2`) 3D element.

If there are `n` data sets to be transformed, as in typical phase-sensitive experiments, `4*n` coefficients must be supplied. The first `2*n` coefficients are the contributions to the real part of the interferogram, alternating between absorptive and dispersive parts of the successive data sets. The next `2*n` coefficients are the contributions to the imaginary part of the interferogram, in the same order. Thus, using the definition that the first letter refers to the source data set, the second letter refers to the interferogram, and the number identifies the source data set, we have the following cases:

Data sets	*Coefficient order*
1	RR1, IR1, RI1, II1
2	RR1, IR1, RR2, IR2, RI1, II1, RI2, II2
3	RR1, IR1, RR2, IR2, RR3, IR3, RI1, II1,

Data sets	*Coefficient order*
	RI2, II2, RI3, II3
. . .	. . .

The coefficients are often 1, 0, or -1, but this is not always the case. Any non-integral coefficient can be used, and as many coefficients can be nonzero as is desired. Up to 32 coefficients can be supplied, which at 4 per data set allows the addition, subtraction, etc., of eight 2D data sets (e.g., 8 different phase cycles).

For information on real as opposed to complex Fourier transforms, see the descriptions of the proc, proc1, and proc2 parameters. For information about Hadamard transforms, see the description of the proc1 parameter and the *VnmrJ NMR Liquids* user guide. For information on left-shifting, zero-order phase rotation, and frequency shifting of the FID and interferogram time-domain data during the 2D Fourier transformation, see the descriptions of the parameters lsfid, lsfid1, lsfid2, phfid, phfid1, phfid2, lsfrq, lsfrq1, and lsfrq2, as appropriate. For information on the lfs (low-frequency suppression) and zfs (zero-frequency suppression) solvent suppression options, see the description of parameters ssfilter and ssorder, and macro parfidss.

Arguments: array_element is a single array element to be transformed.

options can be any of the following (all string arguments must precede the numeric arguments):

- 'ptype' is a keyword to transform P-type data to yield a P-type contour display.
- 'ntype' is a keyword to transform N-type data to yield a P-type contour display. This is the default.
- 't2dc' is a keyword to apply a dc correction to each t_2 FID prior to the first Fourier transform. The last 1/16-th of the time domain data is used to calculate the dc level.
- 't1dc' is a keyword to apply a dc correction to each t_1 interferogram prior to the second Fourier transform. The last 1/16-th of the time domain data is used to calculate the dc level.
- 'f2sel' is a keyword to allow only preselected f_2 regions to be transformed along t_1. The t_1 interferograms in the non-selected f_2 regions are zeroed but *not* transformed. The same mechanism used to select baseline regions for baseline correction (bc) is used to select the f_2 regions to be transformed along t_1. Set intmod='partial' and partition the integral of the spectrum into several regions. The even numbered f_2 regions (e.g., 2, 4, 6) are transformed along t_1; the odd numbered regions are not transformed along t_1.
- 'nf' is a keyword to transform arrayed or multi-slice 2D data that has been collected in the compressed form as single 2D FIDs with multiple (nf) traces.
- 'ni2' is a keyword to transform non-arrayed 2D data that have been collected with ni2 and sw2 (instead of ni and sw1). addpar('3d') creates the necessary processing parameters for the 'ni2' operation.
- 'noop' is a keyword to not perform any operation on the FID data. This option is used mainly to allow macros, such as wft2da, to have the same flexibility as commands.

coefficients are a series of coefficients according to the following scheme: RR1 is the coefficient used to multiply the real part (first R) of spectra set 1 before it is added to the real part (second R) of the interferogram. IR2

would thus represent the contribution from the imaginary part of spectra set 2 to the real part of the interferogram, and so forth. The scheme is depicted below.

```
ft2d(RR1,IR1,RR2,IR2,...,RI1,II1,RI2,II2,...)
```

where:

```
RR1*REAL(w2,element=1) ->   REAL(t1)
IR1*IMAG(w2,element=1) -> + REAL(t1)
RR2*REAL(w2,element=2) -> + REAL(t1)
IR2*IMAG(w2,element=2) -> + REAL(t1)
. . .
RI1*REAL(w2,element=1) ->   IMAG(t1)
II1*IMAG(w2,element=1) -> + IMAG(t1)
RI2*REAL(w2,element=2) -> + IMAG(t1)
II2*IMAG(w2,element=2) -> + IMAG(t1)
```

`'ni'` is a keyword to selectively transform a particular `np`–`ni` 2D plane within a non-arrayed 3D data set. To identify the plane, `'ni'` is followed by the `plane_number` argument, an integer from `1` through `ni2`.

`'ni2'` is a keyword to selectively transform a particular `np`–`ni2` 2D plane within a non-arrayed 3D data set. To identify the plane, `'ni2'` is followed by the `plane_number` argument, an integer from `1` through `ni`.

`element_number` is the number of an element within the explicit array when selectively processing an arrayed 3D data set; it ranges from `1` to `ni2`

`increment` is the increment within the explicit array when selectively processing an arrayed 3D data set; it ranges `1` to `arraydim/(ni*ni2)`.

Examples:

```
ft2d(1,0,0,0,0,0,1,0)
ft2d(1)
ft2d('nf',3)
ft2d('ptype',...)
```

See also: *NMR Spectroscopy User Guide*

Related:

`dconi`	Interactive 2D data display (C)
`dcrmv`	Remove dc offsets from FIDs in special cases (P)
`fpmult`	First point multiplier for `np` FID data (P)
`fpmult1`	First point multiplier for `ni` interferogram data (P)
`ft1d`	Fourier transform along f_2 dimension (C)
`lsfid`	Number of complex points to left-shift `np` FID (P)
`lsfid1`	Number of complex points to left-shift `ni` interferogram (P)
`lsfid2`	Number of complex points to left-shift `ni2` interferogram (P)
`lsfrq`	Frequency shift of the `fn` spectrum (P)
`lsfrq1`	Frequency shift of the `fn1` spectrum (P)
`lsfrq2`	Frequency shift of the `fn2` spectrum (P)
`parfidss`	Create parameters for time-domain solvent subtraction (M)
`phfid`	Zero-order phasing constant for `np` FID (P)
`phfid1`	Zero-order phasing constant for `ni` interferogram (P)
`phfid2`	Zero-order phasing constant for `ni2` interferogram (P)
`proc`	Type of processing on `np` FID (P)
`proc1`	Type of processing on `ni` interferogram (P)
`proc2`	Type of processing on `ni2` interferogram (P)
`pmode`	Processing mode for 2D data (P)
`ssorder`	Order of polynomial to fit digitally filtered FID (P)
`ssfilter`	Full bandwidth of digital filter to yield a filtered FID (P)
`wft1d`	Weight and Fourier transform f_2 for 2D data (C)
`wft2d`	Weight and Fourier transform 2D data (C)

ft2da — Fourier transform phase-sensitive data (M)

Syntax: `ft2da<(options)>`

Description: Processes 2D FID data and 2D planes at particular t_1 or t_2 times from a 3D data set for a pure absorptive display. `ft2da` differs from `wft2da` only in that, in the case of `wft1da`, weighting of the time-domain data is performed prior to the FT. `ft2da` functions analogously to `ft1da` and `wft1da`, except that `ft2da` and `wft2da` perform only the f_2 Fourier transform. For information about Hadamard transforms, see the description of the `proc1` parameter and the *VnmrJ NMR Liquids* user guide.

Macros `ft1da`, `wft1da`, `ft2da`, and `wft2da` function for hypercomplex 2D FID data (`phase=1,2`) and for TPPI 2D FID data (`phase=3` or `phase=1,4`) acquired either with `ni` or `ni2`. If the data were acquired with `ni`, no additional arguments need be used with the macros. If the data were acquired with `ni2`, the keyword `'ni2'` must be used.

For `phase=1,2`:
`wft2da=wft2d('ptype',1,0,0,0,0,0,1,0)`

For `phase=3`: `wft2da=wft2d(1,0,0,0)`

For `phase=1,4`:
`wft2da=wft2d('ptype',1,0,0,0,0,0,1,0)`

Macros `ft1da`, `wft1da`, `ft2da`, and `wft2da` support selective 2D processing within a 3D FID data set. All permutations of hyercomplex and TPPI modes of data acquisition in t_1 and t_2 can be handled. For selective f_2f_3 processing, the numeric argument immediately following the `'ni2'` keyword is interpreted to be the t_1 increment number, which specifies the particular f_2f_3 plane (`plane_number`, see below) to be processed. For selective f_1f_3 processing, the t_2 increment number either follows the keyword `'ni'`, which is optional, or is associated with the first numeric argument that does not immediately follow a `'bc'` keyword.

For information on real as compared to complex Fourier transformation, see the description of `proc` or `proc1`. For information on the lfs (low-frequency suppression) and zfs (zero-frequency suppression) solvent suppression options, see the description of parameters `ssfilter` and `ssorder`, and the macro `parfidss`.

Arguments: `options` can be any of the following (the order is not important):

- `'ntype'`, `'t2dc'`, `'t1dc'`, and `'f2sel'` are keywords that function the same as when supplied to the `ft2d` and `wft2d` commands. Refer to the `ft2d` command for a description of these options.
- `'bc'` is a keyword for a baseline correction of the phase-corrected f_2 spectra prior to the f_1 Fourier transform. The baseline regions must have been previously determined. The default polynomial order is 1, which leads to a spline fit. A different polynomial order can be specified by inserting a numerical argument following `'bc'`.
- `'dc'` is a keyword for a drift correction (`dc`) of the f_2 spectra prior to the f_1 Fourier transformation.
- `'ni'` is a keyword to selectively transform a particular `np`–`ni` 2D plane within a non-arrayed 3D data set. To identify the plane, `'ni'` is followed by `plane_number`, an integer from `1` through `ni2`.
- `'ni2'` is a keyword to selectively transform a particular `np`–`ni2` 2D plane within a non-arrayed 3D data set. To identify the plane, `'ni2'` is followed by `plane_number`, an integer from `1` through `ni`.
- `'old'` is a keyword to allow data acquired before the February 25, 1988, software release to be processed correctly. `'old'` does not function for

selective 2D processing within 3D data sets. If no ni2 or ni plane_number is given, it is assumed that the data set is only 2D in either ni2 or ni, respectively.

See also: *NMR Spectroscopy User Guide*

Related:

f1coef	Coefficient to construct F1 interferogram (P)
f2coef	Coefficient to construct F2 interferogram (P)
ft1da	Fourier transform phase-sensitive data (M)
parfidss	Create parameters for time-domain solvent subtraction (M)
phase	Phase selection (P)
proc	Type of processing on the np FID (P)
proc1	Type of processing on the ni interferogram (P)
ssorder	Order of polynomial to fit digitally filtered FID (P)
ssfilter	Full bandwidth of digital filter to yield a filtered FID (P)
wft1da	Weight and Fourier transform phase-sensitive data (M)
wft2da	Weight and Fourier transform phase-sensitive data (M)

ft2dac — Combine arrayed 2D FID matrices (M)

Syntax: `ft2dac<(<mult1><,mult2>,...<,multn>)>`

Description: Allows ready combination of 2D FID matrices within the framework of the 2D FT program. No weighting is performed. Data must be acquired either without f_1 quadrature or with f_1 quadrature using the TPPI method. ft2dac is used with TOCSY (with multiple mixing times).

Arguments: mult1,mult2,...,multn are multiplicative coefficients. The nth argument is a real number and specifies the coefficient for the nth 2D FID matrix.

Related:

ft1dac	Combine arrayed 2D FID matrices (M)
Tocsy	Set up parameters for a TOCSY pulse sequence (M)
wft1dac	Combine arrayed 2D FID matrices (M)
wft2dac	Combine arrayed 2D FID matrices (M)

ft3d — Perform a 3D Fourier transform on a 3D FID data set (M,U)

Syntax: (From VnmrJ) `ft3d<(<data_directory><,number_files><,'nocoef'><,'t1t2'|'t2t1'><,'fdf'><,'nofdf'><,plane_type>)>`

Description: Transforms 3D FID data into 3D spectral data. ft3d can be entered from a macro or directly from UNIX. Each type of entry is described below. A final section explains the ft3d coefficient file.

Additional parameter control for the operation of ft3d is available. This allows drift corrections and partial Fourier transformation. See the descriptions of specdc3d, fiddc3d, and ptspec3d for information.

The 3D FID data must be loaded into the experiment in which the ft3d macro is to be run. ft3d is started up in background mode by this macro so that VnmrJ remains free for interactive processing. You can start a 3D transform from within exp4 and, at the same time, continue with any 1D or 2D processing of the 3D FID data within the same experiment using VnmrJ.

Distributed f_1f_2 processing has the following system and network requirements:

- The system on which the macro ft3d is executed from within VnmrJ must define the names of the networked computers that are to participate in the

distributed processing. The file /etc/hosts.3D must contain these names in the following format:

```
unity1
unity2
datastation1
datastation2
```

- Each participating computer must recognize the name of the user that started up the master ft3d program as a valid user name on its system. For example, if user steve issues the ft3d command within VnmrJ running on computer unity0, steve must be a valid user on all other computer systems that are to be used in the distributed f_1f_2 processing.
- Each computer system must have NFS access to the 3D data directory.

Arguments: The order of the arguments is not important.

data_directory (without the /data subdirectory appended) specifies the output directory for the 3D spectral data file(s). The default directory for the 3D spectral data is curexp/datadir3d.

number_files sets the number of 3D data files (data1, data2, ... data*n*, where *n* is number_files) used to store the transformed 3D data. number_files must be an integer and be 32 or less. When number_files is entered, distributed f_1f_2 processing is performed by ft3d if possible.

'nocoef' is a keyword for the set3dproc command within the ft3d macro to not create a 3D coefficient file prior to invoking the ft3d program. This option is useful if you have modified an existing 3D coefficient file and do not want it to be overwritten prior to the 3D transform. See below for information on coefficient files. By default, ft3d calls the make3dcoef macro to create a coefficient file using the f1coef and f2coef string parameter values.

't1t2' and 't2t1' are keywords to explicitly define the order of the t1 and t2 arrays (other than ni and ni2). By default, ft3d looks at the array parameter and if any parameter other than phase and phase2 are arrayed, the macro aborts.

'fdf' indicates that the output of ft3d is to be an FDF (Flexible Data Format) file named data.fdf. This is the default if the parameter appmode is set to 'imaging'. Distributed processing can still be performed if number_files is set appropriately. 3D FDF files can be viewed with the ImageBrowser.

'nofdf' indicates that the final output is the group of data1, data2, ... files, and that no FDF format file should be produced. This is the default if the parameter appmode is *not* set to 'imaging'.

plane_type sets plane extraction following the complete 3D FT with the following keywords:

- 'xall' indicates that all three 2D plane types, f_1f_3, f_2f_3, and f_1f_2, are to be automatically extracted at the end of the 3D Fourier transform.
- 'f1f3', 'f2f3', and 'f1f2' can be used to select any combination of plane types to be extracted.

Any of these options can be submitted more than once to the ft3d program, but the getplane program will display an error and abort if any one plane type is defined for extraction more than once.

Examples:

```
ft3d
ft3d('nocoef','f1f3','f2f3')
```

ft3d Entered from UNIX
(From UNIX) ft3d -e exp_number -f -r <options>

The ft3d program can also be run directly from the UNIX environment on the host computer. An information file must be present before ft3d can execute successfully but it need contain only valid processing information for the t_3 dimension and valid Fourier numbers for the t_1 and t_2 transforms. Valid weighting and phasing parameters for the f_1 and f_2 dimension do not need to be set while wftt3 executes. After several FIDs have been collected, you can determine acceptable f_3 weighting and phasing parameters. After setting fn1 and fn2 to the desired values, the 3D processing information file can be created by typing set3dproc in the VnmrJ command line. At that point, the next invocation of ft3d by the macro wftt3 causes all (t_1,t_2) increment sets up to and including the current increment in t_3 to be processed.

To start ft3d on a remote computer running as a data station for the system, log in as root *and enter one of the following commands* so that the master ft3d program can properly communicate with the computer*:*

- Enter /vnmr/acqbin/Infoprc &

With the Infoprc or acqinfo_svc program running, enter ft3d with the -h option and the necessary arguments. The ft3d program invoked with the -h option is considered to be the master program and is responsible for spawning additional remote ft3d processes.

Each remote computer must be able to access the 3D data directory as if it were stored on a local disk, must recognize the user name under which the master ft3d program is being run, and must also have permission to read from and write to that directory. If the 3D data directory contains four f_3 transformed data files (data1– data4), the master ft3d program uses the first three remote computer systems listed in file hosts.3D that respond.

If the multihost processing option is selected, the number of computers involved will be no more than the number of sets the f_3 spectral data is partitioned into. This number is selected with the -m option (see below).

If you are unsure of whether to use Infoprc or acqinfo_svc on the remote computer, change directories to /vnmr/acqbin, enter lf, and check which program is present.

Note that if the host computer is rebooted, the background command (Infoprc or acqinfo_svc) has to be entered again.

Arguments: Note that entering ft3d with an ampersand (&) after the arguments makes the command execute in the background. As a result, the UNIX prompt reappears after the command is entered and further commands can be entered and executed while the ft3d command is processing.

- -e exp_number is the experiment number where 3D processing is to occur. This argument is required. It must be written as a minus sign, the letter e, a space, and a valid experiment number from 1 to 9 (e.g., -e 3 sets experiment 3). The experiment must already exist.

The following two options should always be set for reliable operation:

- -f specifies that any existing 3D data sets in the experiment should be deleted. This option requires no additional value.
- -r calls for explicit data reduction after the 3D Fourier transform. Data reduction consists of retaining only the “real-real-real” part of the completely transformed 3D data set. The -r option is mandatory and is enforced within ft3d regardless of the user command line input.

options can be any of the following:

- -F header_file indicates that an FDF (Flexible Data Format) output file should be produced, using the FDF header found in header_file. The output file will be named data.fdf, and the data1, data2, ... files will not be produced.

- `-h` selects the multihost processing option. The `/etc/hosts.3D` file must exist and contain the names of the remote hosts, one host name per line. Each remote host must also have either the program `Infoprc` or the program `acqinfo_svc` running in the background (one of these programs is already running on any computer being used as a spectrometer host).
- `-l` specifies that a log file be generated in the data subdirectory of the `datadir3d` directory.
- `-m` partitions the f_3 transformed spectral data over more than one data file. This partitioning is necessary if the distributed processing capability of `ft3d` is to be used in performing the remaining f_1 and f_2 transforms. The syntax `-mnfiles` is used to specify `nfiles`, the number of data files into which the 3D spectral data is to be divided (e.g., `-m4` specifies 4 data files). Each such data file contains an f_3 subset of the f_1f_2 spectral planes. If `nfiles` is not specified, `ft3d` reports an error and aborts. If `nfiles` is less than an internally calculated value (based on `memsize` and the maximum size for a single 2D transform), the number of data files is set to the internally calculated value; otherwise, `nfiles` determines the number of data files to be used. The maximum number of such files is currently defined to be 32. These 3D data files are labeled `data1,deta2,...,datan`.
- `-o` specifies an alternative output directory for the processed 3D data. The default directory is `datadir3d` within the current experiment. A full UNIX path must follow the `-o` option.
- `-p` specifies the time-domain dimensions to be processed. If `-p` is used, the processed dimensions can be specified as `f3f2f1`, `f3f2`, `f2f3`, `f2f1`, `f1f2`, `f3`, `f2`, and `f1`. The values `f3f1` and `f1f3` are not allowed because processing must be done sequentially in the order f_3, then f_2, and then f_1. If the `-p` option is not invoked, `ft3d` defaults to `f3f2f1`, resulting in a completely transformed 3D data set.
- `-s` specifies processing of the f_3 dimension of the 3D FID data concurrently with data acquisition. In practice, concurrent f_3 processing is realized by setting `wnt='wftt3'` in the VnmrJ parameter set and starting the 3D acquisition by entering `au`. The macro `wftt3` handles the call to `ft3d` at the appropriate times during data collection.
- `-x` specifies that plane extractions be performed at the end of 3D processing. The available planes are defined as `f1f2`, `f1f3`, and `f2f3`. If more than one plane extraction is desired, the planes are separated by a colon. For example, `-x f1f2:f1f3:f2f3` would extract all three planes. The planes are placed in the `extr` subdirectory of `datadir3d`.

Examples: (From UNIX) `ft3d -r -f -l -e 2 &`
(From UNIX) `ft3d -r -f -l -e 2 -x f1f2:f1f3:f2f3 &`

See also: *NMR Spectroscopy User Guide*

Related:

`appmode`	Application mode (P)
`dconi`	Interactive 2D data display (C)
`fiddc3d`	3D time-domain dc correction (P)
`f1coef`	Coefficient to construct F1 interferogram (P)
`f2coef`	Coefficient to construct F2 interferogram (P)
`getplane`	Extract planes from a 3D spectral data set (M)
`killft3d`	Terminate any `ft3d` process started in an experiment (M,U)
`make3dcoef`	Make 3D coefficients file from 2D coefficients (M)
`ptspec3d`	Region-selective 3D processing (P)

set3dproc	Set 3D processing (C)
specdc3d	3D spectral dc correction (P)
wftt3	Process f_3 dimension during 3D acquisition (M)

full — Set display limits for a full screen (C)

Description: Sets the horizontal control parameters (sc and wc) and the vertical control parameters (sc2 and wc2) to produce a display (and subsequent plot) on the entire screen (and page). For 2D data, space is left for the scales.

Related:

center	Set display limits for center of screen (C)
fullt	Set display limits for full screen with room for traces (C)
left	Set display limits for left half of screen (C)
right	Set display limits for right half of screen (C)
sc	Start of chart (P)
sc2	Start of chart in second direction (P)
wc	Width of chart (P)
wc2	Width of chart in second direction (P)

fullsq — Display largest square 2D display (M)

Description: Adjusts sc, sc2, wc, and wc2 parameters to show the largest possible square 2D display.

Related:

full	Set display limits for a full screen (C)
fullt	Set display limits for a full screen with room for traces (C)
sc	Start of chart (P)
sc2	Start of chart in second direction (P)
wc	Width of chart (P)
wc2	Width of chart in second direction (P)

fullt — Set display limits for a full screen with room for traces (C)

Description: Sets the horizontal control parameters (sc and wc) and the vertical control parameters (sc2 and wc2) to produce a display (and subsequent plot) in the entire screen (and page) with room for traces (dconi). For 2D data, space is left for the scales.

Related:

center	Set display limits for center of screen (C)
full	Set display limits for a full screen (C)
left	Set display limits for left half of screen (C)
right	Set display limits for right half of screen (C)

G

g2pul_ecc	Setup macro for eddy current compensation parameters (M)
ga	Submit experiment to acquisition and FT the result (M)
gain	Receiver gain (P)
gap	Find gap in the current spectrum (M)
gaussian	Set up unshifted Gaussian window function (M)
gcal	Gradient calibration constant (P)
gcoil	Current gradient coil (P)
Gcosy	Convert the parameter to a gradient COSY experiment (M)
gdiff	Diffusion gradient level (P)
Gdqcosy	Convert the parameter to a gradient DQCOSY experiment (M)
get1d	Select a 1D experiment for processing (M)
get2d	Select a 2D experiment for processing (M)
getdim	Return dimensionality of experiment (M)
getfile	Get information about directories and files (C)
getlimit	Get the limits of a variable in a tree (C)
getll	Get intensity and line frequency of line (C)
getparam	Retrieve parameter from probe file (M)
getplane	Extract planes from a 3D spectral data set (M)
getreg	Get frequency limits of a specified region (C)
getsn	Get signal-to-noise estimate of a spectrum (M)
gettoken	Utility macro to separate a string into tokens (M)
gettxt	Get text file from VnmrJ data file (C)
gettype	Get the type of a variable (C)
getvalue	Get value of parameter in a tree (C)
gf	Prepare parameters for FID/spectrum display in acqi (M)
gf	Gaussian function in directly detected dimension (P)
gf1	Gaussian function in 1st indirectly detected dimension (P)
gf2	Gaussian function in 2nd indirectly detected dimension (P)
gflow	Flow encoding gradient level (P)
gfs	Gaussian shift const. in directly detected dimension (P)
gfs1	Gaussian shift const. in 1st indirectly detected dimension (P)
gfs2	Gaussian shift const. in 2nd indirectly detected dimension (P)
Ghmbc	Convert the parameter to a gradient HMBC experiment (M)
ghmqc	Set up a PFG HMQC pulse sequence (M)
Ghmqc	Convert the parameter to a gradient HMQC experiment (M)
gHMQC15	Set up parameters for ^{15}N gHMQC experiment (M)
gHMQC_d2	Set up parameters for ^{15}N gHMQC experiment using dec. 2 (M)
gHMQC_d213	Set up parameters for ^{13}C gHMQC experiment using dec. 2 (M)
ghmqcps	Set up a PFG HMQC phase-sensitive pulse sequence (M)
ghsqc	Set up a PFG HSQC pulse sequence (M)
Ghsqc	Convert the parameter to a gradient HSQC experiment (M)
gHSQC15	Set up parameters for ^{15}N gHSQC experiment (M)
gHSQC_d2	Set up parameters for ^{15}N gHSQC experiment using dec. 2 (M)

G

gHSQC_d213	Set up parameters for ^{13}C gHSQC experiment using dec. 2 (M)
Ghsqctoxy	Convert parameters for gradient HSQCTOXY experiment (M)
gilson	Open the Gilson Liquid Handler window (C)
gin	Return current mouse position and button values (C)
globalauto	Automation directory name (P)
glue	Create a pseudo-2D dataset (M)
gmapshim	Start gradient autoshimming (M)
gmapshim_au	Start acquisition with gradient shimming (M)
gmapspin	Enable or disable spinning during gradient shimming (P)
gmapsys	Run gradient autoshimming, set parameters, map shims (M)
gmapz	Get parameters and files for gmapz pulse sequence (M)
gmap_findtof	Gradient shimming flag to first find tof (P)
gmap_z1z4	Gradient shimming flag to first shim z1-z4 (P)
gmax	Maximum gradient strength (P)
gmqcosy	Set up PFG absolute-value MQF COSY parameter set (M)
gnoesy	Set up a PFG NOESY parameter set (M)
go	Submit experiment to acquisition (M)
go_	Pulse sequence setup macro called by go, ga, and au (M)
gpat-gpat3	Gradient shape (P)
gplan	Start interactive image planning (C)
gradientdisable	Disable PFG gradients (P)
gradientshaping	Activate shaping on the gradient pulses (P)
gradstepsz	Gradient step size (P)
gradtype	Gradients for X, Y, and Z axes (P)
graphis	Return the current graphics display status (C)
grayctr	Gray level window adjustment (P)
graysl	Gray level slope (contrast) adjustment (P)
grecovery	Eddy current testing (M)
grid	Draw a grid on a 2D display (M)
groupcopy	Copy parameters of group from one tree to another (C)
gspoil	Spoiler gradient level (P)
gsspat	Slice-select gradient shape (P)
gtnnoesy	Set up a PFG TNNOESY parameter set (M)
gtnroesy	Set up a PFG absolute-value ROESY parameter set (M)
gtotlimit	Gradient total limit (P)
gtrim	Trim gradient level (P)
gxmax,gymax,gzmax	Maximum gradient strength for each axis (P)
gzlvl	Pulsed field gradient strength (P)
gzsize	Number of z-axis shims used by gradient shimming (P)
gzwin	Spectral width percentage used for gradient shimming (P)

g2pul_ecc — Setup macro for eddy current compensation parameters (M)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Setup macro for pulse sequence used to determine the eddy current compensation parameters.

ga — Submit experiment to acquisition and FT the result (M)

Syntax: `ga<(<'nocheck'><,'next'><,'wait'>)>`

Description: Performs experiment described by the current acquisition parameters, checking parameters `loc`, `spin`, `gain`, `wshim`, `load`, and `method` to determine the necessity to perform various actions in addition to simple data acquisition. This may involve a single FID or multiple FIDs, as in the case of arrays or 2D experiments. `ga` causes the data to be automatically weighted and Fourier transformed (`wft`) at the end of each FID data acquisition.

Before starting the experiment, `ga` executes two user-created macros if they exist. The first is `usergo`, a macro that allows the user to set up general conditions for the experiment. The second is a macro whose name is formed by `go_` followed by the name of the pulse sequence (from `seqfil`) to be used (e.g., `go_s2pul, go_dept`). The second macro allows a user to set up experiment conditions suited to a particular sequence.

Arguments: `'nocheck'` is a keyword to override checking if there is insufficient free disk space for the complete 1D or 2D FID data set to be acquired.

`'next'` is a keyword to put the experiment started with `ga('next')` at the head of the queue of experiments to be submitted to acquisition.

`'wait'` is a keyword to stop submission of experiments to acquisition until `wexp` processing of the experiment, started with `ga('wait')`, is finished.

See also: *NMR Spectroscopy User Guide*

Related:

`au`	Submit experiment to acquisition and process data (M)
`change`	Submit a change sample experiment to acquisition (M)
`gain`	Receiver gain (P)
`go`	Submit experiment to acquisition (M)
`go_`	Pulse sequence setup macro called by `go`, `ga`, and `au` (M)
`load`	Load status of displayed shims (P)
`loc`	Location of sample in tray (P)
`lock`	Submit an Autolock experiment to acquisition (C)
`method`	Autoshim method (P)
`sample`	Submit change sample, Autoshim experiment to acquisition (M)
`seqfil`	Pulse sequence name (P)
`shim`	Submit an Autoshim experiment to acquisition (C)
`spin`	Submit a spin setup experiment to acquisition (C)
`spin`	Sample spin rate (P)
`su`	Submit a setup experiment to acquisition (M)
`usergo`	Experiment setup macro called by `go`, `ga`, and `au` (M)
`wft`	Weight and Fourier transform 1D data (C)
`wshim`	Conditions when shimming is performed (P)

gain — Receiver gain (P)

Description: Sets receiver gain or, by setting `gain='n'`, enables Autogain for automatic adjustment of gain. Low gain in multiline, high-dynamic-range samples can cause a number of problems, including intermodulation distortions and extra lines in the spectrum. Too high a gain, on the other hand, can cause receiver overload and consequent baseline distortions. Autogain capability allows the observe channel to be set optimally for detecting and digitizing NMR signals from a wide variety of samples.

Autogain adjusts the observe channel gain such that the NMR signal takes about 50 percent of the maximum range of the ADC. This setting allows a comfortable leeway for variations in signal. The program begins acquisition in the normal manner but the first transient (after any requested steady state transients) is

examined for signal level. If the intensity is too low or too high, the gain is changed and the process is repeated until the intensity is within the proper range, and then normal acquisition commences. The final gain value used for the experiment is stored and when the experiment is finished, setting `gain='y'` results in the value being displayed in the `dgs` parameter group.

If the gain is reduced by the Autogain procedure such that the noise does not trigger the least significant 1 or 2 bits in the ADC and the signal still overloads either the receiver or ADC, the system stops and displays a message indicating Autogain failure.

Values: 0 to 60, in steps of 2 dB (60 represents highest possible receiver gain and 0 lowest). On 500-750-MHz systems, low-band gain is limited from 18 to 60.

`'n'` enables Autogain, in which the gain is automatically adjusted at the start of acquisition for an optimum value. After the acquisition is finished, setting `gain='y'` then allows the value of gain to be read. `gain='n'` may not be used for arrayed experiments.

See also: *NMR Spectroscopy User Guide*

Related:		
	`dgs`	Display group of special/automation parameters (M)
	`gf`	Prepare parameters for FID/spectrum display in `acqi` (M)

`gap` Find gap in the current spectrum (M)

Syntax: `gap(gap,height):found,position,width`

Description: Looks for a gap between the lines of the currently displayed spectrum. It can be used to automatically place inserts, parameter printouts, trace labels, etc. The search starts on the left side (low-field end) of the spectrum.

Arguments: `gap` is the width of the desired gap.

`height` is the starting height (same as the lower limit for the insert).

`found` is a return value that is set to 1 if the search is successful, or set to 0 if unsuccessful.

`position` is a return value that is set to the distance from the left edge of the chart (not the plot) to the left end of the gap (3 mm from the nearest peak to the left, positioning with “left gravity”) if the search is successful, or set to the position (no spacing to the nearest line) of the largest gap found if unsuccessful.

`width` is a return value set to the total width of the first gap if the search is successful, or set to the width of largest gap found if unsuccessful.

Examples: `gap(120,80);$1,$2,$3`

See also: *User Programming*

`gaussian` Set up unshifted Gaussian window function (M)

Syntax: `gaussian<(<t1_inc><,t2_inc>)>`

Description: Sets up an unshifted Gaussian window function in 1, 2, or 3 dimensions. The macro checks whether the data is 1D, 2D, and 3D.

Arguments: `t1_inc` is the number of t1 increments. The default is `ni`.
`t2_inc` is the number of t2 increments. The default is `ni2`.

See also: *NMR Spectroscopy User Guide*

Related:		
	`ni`	Number of increments in 1st indirectly detected dimension (P)
	`ni2`	Number of increments in 2nd indirectly detected dimension (P)
	`pi3ssbsq`	Set up pi/3 shifted sinebell-squared window function (M)
	`pi4ssbsq`	Set up pi/4 shifted sinebell-squared window function (M)

sqcosine	Set up unshifted cosine-squared window function (M)
sqsinebell	Set up unshifted sinebell-squared window function (M)

gcal — Gradient calibration constant (P)

Applicability: Systems with the pulsed field gradient or the imaging module.

Description: Stores the proportionality constant between the parameter values (DAC units) controlling the desired gradient and the intensity of the gradient expressed in gauss/cm. The gradients generated in the magnet require calibration of the gain on the gradient compensation board so that coordinate data, slice positions, and the field of view can be set up accurately. gcal should be located in each user's vnmrsys/global file.

Values: Number that is probe dependent, in gauss/cm-DAC unit. On the Performa I PFG module, 0.00028 to 0.00055 gauss/cm-DAC unit is nominal; On the Performa II, 0.0014 to 0.0025 gauss/cm-DAC unit is nominal.

See also: *VnmrJ Imaging NMR*

Related	setgcal	Set gradient calibration constant (M)

gcoil — Current gradient coil (P)

Description: Reserved parameter that specifies which physical gradient set is currently installed. This allows convenient updating of important gradient characteristics when one gradient set is interchanged for another. When set, gcoil reads the gradient table file of the same name in /vnmr/imaging/gradtables and sets the gradient calibration parameters.

gcoil is local to each individual experiment. It is normally set the same as sysgcoil for acquiring new data, but can be set to other gradient names when working with saved data or data from another instrument. Each possible gradient name should have an associated file of that name located in the directory /vnmr/imaging/gradtables. Look at any file in this directory for an example of the proper gradtable format, or use the macro creategtable to make new gradtables entries.

If the parameter gcoil does not exist in a parameter set and a user wants to create it, you must set the protection bit that causes the macro _gcoil to be executed when the value for gcoil is changed. There are two ways to create gcoil:

- Use the macro updtgcoil, which will create the gcoil parameter if it does not exist and set the correct protection bits.
- Enter the following commands:

```
create('gcoil','string')
setprotect('gcoil','set',9)
```

gcoil and the associated gradient calibration parameter gmax is updated with the values listed in the table on the right each time a parameter set is retrieved, or when an experiment is joined. In the rare case that a gradtables file is modified, but the value of gcoil is not changed, manually force an update of the calibration parameters. Updating may be accomplished either by setting gcoil to itself, for example, gcoil=gcoil, or by using the macro _gcoil.

Variable Name	*Value*
boresize	22.50 cm
gmax	5.00 gauss/cm
trise	0.000500 sec

Be aware that if an old dataset is returned and processed, gradient parameters associated with that dataset will replace any new `gcoil` *parameters.*

The table is a gradient table (gradient coil name: asg33) for a horizontal imaging system with all three axes set to the same maximum gradient strength.

On the right is a gradient table (gradient coil name: tc203) for a three-axis gradient set with unequal maximum gradient strength.

Variable Name	*Value*
`boresize`	5.10 cm
`trise`	0.000200 sec
`gxmax`	29.00 gauss/cm
`gymax`	27.00 gauss/cm
`gzmax`	70.00 gauss/cm

See also: *User Programming*

Related:

`gmax`	Maximum gradient strength (P)
`setgcoil`	Assign sysgcoil configuration parameter (M)
`sysgcoil`	System gradient coil (P)
`updtgcoil`	Update gradient coil (M)

`Gcosy` Convert the parameter to a gradient COSY experiment (M)

Applicability: Systems with the pulsed field gradient or the imaging module.

Description: Converts a 1D standard two-pulse sequence parameter set into a set ready to run a PFG (pulsed field gradient) absolute-value COSY experiment.

See also: *NMR Spectroscopy User Guide*

`gdiff` Diffusion gradient level (P)

Description: Predefined parameter available for use in setting a diffusion gradient level, often paired with the timing parameters `tdiff` or `tdelta`.

`Gdqcosy` Convert the parameter to a gradient DQCOSY experiment (M)

Description: Convert the parameter to a gradient `Dqcosy` experiment

`get1d` Select a 1D experiment for processing (M)

Syntax: `get1d<(experiment)>`

Description: In nonautomation mode, the macros `hcosy`, `hcapt`, `capt`, `hcdept`, and `cdept` all acquire two or more data sets in the experiment in which the macro was executed. These data sets are stored, complete with Fourier transformed data. The data sets are also stored directly in the experiment. The `get1d` macro is used to select which data set should be active for processing in that experiment. After `get1d` is executed, data can be stored in the conventional way with the `svf` command (e.g., when `hcosy` completes, `get1d` can be used to process the 1D data set).

Arguments: `experiment` is the 1D data set to be used for processing. The default is the `'H1'` experiment.

Examples:

```
get1d
get1d('apt')
```

See also: *NMR Spectroscopy User Guide*

Related:

`capt`	Automated carbon and APT acquisition (M)
`cdept`	Automated carbon and DEPT acquisition (M)
`get2d`	Select a 2D experiment for processing (M)
`hcapt`	Automated proton, carbon, and APT acquisition (M)
`hcdept`	Automated proton, carbon, and DEPT acquisition (M)

hcosy	Automated proton and COSY acquisition (M)
svf	Save FIDs in current experiment (C)

get2d — Select a 2D experiment for processing (M)

Syntax: `get2d<(experiment)>`

Description: In nonautomation mode, the macros hcosy, hcapt, capt, hcdept, and cdept all acquire two or more data sets in the experiment in which the macro was executed. These data sets are stored complete with Fourier transformed data. The data sets are also stored directly in the experiment. The get2d macro is used to select which data set should be active for processing in that experiment. After entering get2d, data may be stored in the conventional way with the svf command. For example, following completion of hcosy, get2d can be used to process the 2D data set.

Arguments: experiment is the 2D data set that should be used for processing. The default is the 'relayh' experiment.

Examples: `get2d('hetcor')`

See also: *NMR Spectroscopy User Guide*

Related:

get1d	Select a 1D experiment for processing (M)
svf	Save FIDs in current experiment (C)

getdim — Return dimensionality of experiment (M)

Syntax: `getdim:dimensions`

Description: Used in other macros to determine the number of dimensions of the current data set. Many macros make decisions based on whether a data set is multidimensional or 1D. getdim makes it easier to access this information.

Arguments: dimensions is a return variable giving the number of dimensions of the data. If ni3 is 2 or greater, dimensions is set to 4; if ni2 is 2 or greater, dimensions is set to 3; if ni is 2 or greater, dimensions is set to 2; and if ni is less than 2 or undefined, dimensions is 1.

Examples: `getdim:r1`

See also: *NMR Spectroscopy User Guide*

Related:

ni	Number of increments in 1st indirectly detected dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
ni3	Number of increments in 3rd indirectly detected dimension (P)

getfile — Get information about directories and files (C)

Syntax:
(1) `getfile(directory):$number_files`
(2) `getfile(directory,file_index):$file,$extension`

Description: Returns information about the number of files in a directory or about a particular file in a directory.

Arguments: directory is the name of the directory for which information is desired.

number_files is the number of files in the directory, with dot files (e.g., .login) ignored.

file_index is the number of file for which information is desired (the order is UNIX-dependent).

file is the name of the file, excluding any extension, identified by the index (see examples below).

`extension` is the extension of the file name identified by the `file_index`. For example, if `file_index` points to the file named `s2pul.fid`, `getfile` returns the string `s2pul` to `$file` and the string `fid` to `$extension`. If the file name pointed to has no extension (e.g., `dummy`), no value is returned to `$extension`. If the file name has more than one extension, only the last extension is returned to `$extension` (e.g., the file `fid.tmp.par` returns `fid.tmp` to `$file` and `par` to `$extension`).

Complete paths (full file names) can be reconstructed like this:

```
getfile('dir',i):$filename,$ext
if ($ext='') then $path='dir'+'/'+$filename
else $path='dir'+'/'+$filename+'.'+$ext
endif
```

Paths for the `rt` command can be reconstructed like this:

```
$path='dir'+'/'+$filename.
```

Examples:

```
getfile('dir'):$entries
$temp = 0
while ($temp < $entries)
   $temp = $temp + 1
   getfile('dir',$temp):$filename,$ext
   ...
endwhile
```

See also: *User Programming*

`getlimit` get the limits of a variable in a tree (C)

Syntax: `getlimit(name[,tree]):$max,$min,$step,$index`

Description: `getlimit` displays or returns the limits of a variable in a tree.

The returned values are the max value, min. value, step size, and index. The fourth argument will return a 0 if the parameter is not using an indexed table lookup for the maximum, minimum, and step size. If the parameter is using the table lookup mechanism, the fourth argument will be set to the index for that table.

The variable trees are `current` (the default), `global`, `processed`, or `systemglobal`.

Arguments: `name` — the name of the variable

`tree` — the variable tree: `current` (the default), `global`, `processed`, or `systemglobal`.

Examples:

```
getlimit('np'):$max,$min,$step,$index
```

sets `$max` to 128000, `$min` to 32, `$step` to 2 and `$index` to 0

```
getlimit('lockfreq','systemglobal'):$max
```

sets `$max` to 160

```
getlimit('dpwr'):$max,$min,$step,$index
```

sets `$max` to 49, `$min` to 0 `$step` to 1 and `$index` to 9

Related:

`setlimit`	Set limits of a parameter in a tree (C)
`setprotect`	Set protection mode of a parameter (C)

`getll` Get intensity and line frequency of line (C)

Syntax: `getll(line_number)<:height,frequency>`

Description: Finds the height and frequency of line from a line listing. It assumes a previous line list using dll.

Arguments: line_number is the number of the line in the line list.

height is the intensity of the specified line.

frequency is the line frequency with units defined by the parameter axis.

See also: *User Programming*

Related:

axis	Axis label for displays and plots (P)
dll	Display listed line frequencies and intensities (C)
fp	Find peak heights (C)
nll	Find line frequencies and intensities (C)

getparam — Retrieve parameter from probe file (M)

Syntax: getparam(param<,nucleus>):$value

Description: Retrieves the value of a parameter from the current probe file. The name of the probe file is referenced from the parameter probe.

Arguments: param is the name of the parameter to be retrieved.

nucleus is the nucleus to be retrieved from the probe file. The default is the current value of the parameter tn

value is a return variable with the value of the retrieved parameter.

Examples:
```
getparam('tpwr'):tpwr
getparam('dmf','H1'):$dmf
```

See also: *NMR Spectroscopy User Guide*

Related:

addnucleus	Add new nucleus to existing probe file (M)
addparams	Add parameter to current probe file (M)
addprobe	Create new probe directory and probe file (M)
probe	Probe type (P)
setparams	Write parameter to current probe file (M)
tn	Nucleus for the observe transmitter (P)
updateprobe	Update probe file (M)

getplane — Extract planes from a 3D spectral data set (M)

Syntax: getplane<(<data_dir><,plane_dir><,plane_type>)>

Description: Executes the program getplane in the VnmrJ system bin directory ($vnmrsystem/bin). getplane checks whether there is sufficient file space on the disk partition to accommodate the extracted planes. If space is insufficient, getplane writes an error to the VnmrJ text window and aborts. getplane does not delete the output plane directory if it is run multiple times to individually extract different plane types.

Arguments: data_dir specifies the directory (without the /data subdirectory) containing the input 3D spectral data. The first non-keyword argument to getplane is always taken to be data_dir.

plane_dir specifies the directory (without the /extr subdirectory) in which the extracted planes are to be stored. The second non-keyword argument to getplane is always taken to be plane_dir. If plane_dir is not specified, data_dir also specifies the output plane directory. If both data_dir and plane_dir are not specified, the input data directory and the output plane directory are set to curexp/datadir3d. The parameter plane is always set equal to the output plane directory.

plane_type can be any of the following keywords:

- 'xall' is a keyword to extract all three 2D plane types: f1f3, f2f3, f1f2.
- 'f1f3', 'f2f3', 'f1f2' are keywords to extract their respective 2D planes.
- Any of these keywords can be submitted more than once to the getplane macro, but the getplane program displays an error and aborts if any one plane type is defined for extraction more than once.

Examples:
```
getplane
getplane('data3d.inp,'data3d.planes','f1f3','f2f3')
```

See also: *NMR Spectroscopy User Guide*

Related:

dplane	Display a 3D plane (M)
dproj	Display a 3D plane projection (M)
dsplanes	Display a series of 3D planes (M)
ft3d	Perform a 3D Fourier transform (M)
nextpl	Display the next 3D plane (M)
path3d	Path to currently displayed 2D planes from a 3D data set (P)
plane	Currently displayed 3D plane type (P)
plplanes	Plot a series of 3D planes (M)
prevpl	Display the previous 3D plane (M)

getreg — Get frequency limits of a specified region (C)

Syntax: `getreg(region_number)<:minimum,maximum>`

Description: Returns the frequency limits of a region. The spectrum should have been previously divided into regions with the region command.

Arguments: region_number specifies the number of the region.

minimum,maximum are return values set to the frequency limits, in Hz, of the specified region.

Examples:
```
getreg(1):$a,$b
getreg($4):cr,$lo
getreg(R1-1):r2,r3
```

See also: *User Programming*

Related:

cz	Clear integral reset points (C)
ds	Display a spectrum (C)
numreg	Return the number of regions in a spectrum (C)
region	Divide spectrum into regions (C)
z	Add integral reset point at cursor position (C)

getsn — Get signal-to-noise estimate of a spectrum (M)

Syntax: `getsn:current_sn,predicted_sn`

Description: Estimates spectrum signal-to-noise using the following algorithm:

- Measures four adjacent 5-percent portions at the left edge of the spectrum, finding the root-mean-square noise, and taking the smallest of the four values. By measuring four different values and finding root-mean- square noise instead of peak noise, the result should be reliable even if several signals are present in the selected regions.
- Next, estimates the signal level using the vertical scale adjustment macros: vsadjh for proton, vsadjc for carbon, and vsadj for other nuclei. For carbon spectra, this algorithm ignores solvent lines and TMS. For proton spectra, in addition to ignoring the largest line in the spectrum, if the tallest line is greater than three times the height of the second tallest line, the

second highest line is be used instead. For other nuclei, getsn uses the tallest line in the spectrum.

- Finally, estimates the signal-to-noise at the end of the experiment by a simple extrapolation (multiplying by the square root of nt/ct).

Arguments: current_sn is a return value set to the current signal-to-noise level.

predicted_sn is a return value set to the predicted signal-to-noise level at the end of the experiment.

See also: *NMR Spectroscopy User Guide*

Related:

ct	Completed transients (P)
nt	Number of transients (P)
testsn	Test signal-to-noise ratio (M)
vsadj	Adjust vertical scale (M)
vsadjc	Adjust vertical scale for carbon spectra (M)
vsadjh	Adjust vertical scale for proton spectra (M)

gettoken — Utility macro to separate a string into tokens (M)

Syntax: gettoken(input_string<,delimiter>):output_string, next_location

Description: Gets the first occurrence of a substring in input_string which is delimited by delimiter, or by the default delimiter '$'. The substring is returned in output_string. The next location in the string after the second delimiter is returned as a real in next_location. If there are not both one occurrence of each of the beginning delimiter and the second delimiter - in other words, if the delimiters are not paired - an empty string is returned in output_string, and -1 is returned in next_location. If the delimited substring is the last substring in input_string, then the substring is returned as expected, but next_location returns -1.

Arguments: input_string

The string to be tokenized delimiter is the delimiter for the tokens (default is $)

Examples:

```
gettoken($mydirname):$mytoken, $next_location
gettoken($mydirname,'%'):$mytoken, $next_location
```

Related: reqpartest Tests whether required parameters are set (M)

gettxt — Get text file from VnmrJ data file (C)

Syntax: gettxt(file)

Description: Copies text from a data file to the current experiment.

Arguments: file is the name of a VnmrJ data file saved from an experiment (i.e., a directory with a .fid or .par suffix). Do not include the file name suffix.

Examples:

```
gettxt('/vnmr/fidlib/fid1d')
```

See also: *NMR Spectroscopy User Guide*

Related: puttxt Put text file into another file (C)

gettype — Get the type of a variable (C)

Syntax: gettype(name[, tree])<:index, name>

Description: Displays or returns the type of an existing variable.

Arguments: A “string” variable can return type 'string' or ‘flag’. A “real” variable can return type 'real', 'delay', ‘frequency’, ‘pulse’, or 'integer’. gettype returns one or two values to a macro. The first value is an integer corresponding to the parameter type. The second value is the name of the parameter type. name can be used in commands such as settype and create.

An optional tree argument can be given. Variables are 'current', 'global', 'processed', and 'systemglobal'.

The default is to search for the parameter in the 'current', 'global', and 'systemglobal' trees, in that order.

Examples: gettype('dmm'):$int,$name sets $int to 4 and $name to 'flag'.

See also: gettype('pw'):$int,$name sets $int to 6 and $name to 'pulse'.

getvalue — Get value of parameter in a tree (C)

Syntax: getvalue(parameter<,index><,tree>)

Description: Gets the value of any parameter in a tree. The value of most parameters can be accessed simply by using their name in an expression. For example, sw? or r1=np accesses the value of sw and np, respectively. However, parameters in the processed tree cannot be accessed that way; getvalue can be used to get the value of a parameter in the processed tree.

Arguments: parameter is the name of an existing parameter.

index is the number of a single element in an arrayed parameter. Default is 1.

tree is one of the keywords 'global', 'current', 'processed', or 'systemglobal'. The default is 'processed'. Refer to the create command for more information on the types of parameter trees.

Examples: getvalue('arraydim')

See also: *User Programming*

Related:

create	Create new parameter in a parameter tree (C)
display	Display parameters and their attributes (C)
setgroup	Set group of a parameter in a tree (C)
setlimit	Set limits of a parameter in a tree (C)
setprotect	Set protection mode of a parameter (C)
settype	Change type of a parameter (C)
setvalue	Set value of any parameter in a tree (C)

gf — Prepare parameters for FID/spectrum display in acqi (M)

Description: Provided as a model for preparing parameters for the FID and spectrum display in acqi. The unmodified version of this macro turns off phase cycling, autoshimming, autolocking, spin control, temperature control, sample changer control, and autogain. It also selects the current pulse sequence and parameter set by issuing the command go('acqi') and the command acqi('par'). The automation parameters cp, wshim, alock, spin, temp, loc, and gain are then reset to their original values. Users can customize gf by copying it into their private maclib directory and editing that version to suit their needs.

See also: *NMR Spectroscopy User Guide*

Related:

acqi	Interactive acquisition display process (C)
alock	Automatic lock status (P)
cp	Cycle phase (P)
dmgf	Absolute-value display of FID data and spectrum in acqi (P)
gain	Receiver gain (P)

go	Submit an experiment to acquisition (C)
loc	Location of sample in tray (P)
spin	Sample spin rate (P)
temp	Sample temperature (P)
wshim	Conditions when shimming performed (P)

gf — Gaussian function in directly detected dimension (P)

Description: Defines a Gaussian time constant of the form `exp(-(t/gf)2)` along the directly detected dimension. This dimension is referred to as the f_2 dimension in 2D data sets, the f_3 dimension in 3D data sets, etc.

Values: Number, in seconds. Typical value is `gf='n'`.

See also: *NMR Spectroscopy User Guide*

Related:

gf1	Gaussian function in 1st indirectly detected dimension (P)
gf2	Gaussian function in 2nd indirectly detected dimension (P)
gfs	Gaussian shift constant in directly detected dimension (P)

gf1 — Gaussian function in 1st indirectly detected dimension (P)

Description: Defines a Gaussian time constant of the form `exp(-(t/gf1)2)` along the first indirectly detected dimension. This dimension is referred to as the f_1 dimension of a multidimensional data set. `gf1` works analogously to the parameter `gf`. The "conventional" parameters, such as `lb` and `gf`, operate on the detected FIDs, while this "2D" parameter is used during processing of the interferograms.

Values: Number, in seconds.

See also: *NMR Spectroscopy User Guide*

Related:

gf	Gaussian function in directly detected dimension (P)

gf2 — Gaussian function in 2nd indirectly detected dimension (P)

Description: Defines a Gaussian time constant of the form `exp(-(t/gf2)2)` along the second indirectly detected dimension. This dimension is referred to as the f_2 dimension of a multidimensional data set. `gf2` works analogously to the parameter `gf`. The `wti` program can be used to set `gf2` on the 2D interferogram data.

Values: Number, in seconds.

See also: *NMR Spectroscopy User Guide*

Related:

gf	Gaussian function in directly detected dimension (P)
wti	Interactive weighting (C)

gflow — Flow encoding gradient level (P)

Description: Predefined parameter available for use in setting a flow encoding gradient level, often paired with the timing parameter `tflow`.

See also: *VnmrJ Imaging NMR*

gfs — Gaussian shift const. in directly detected dimension (P)

Description: Working in combination with the `gf` parameter, `gfs` allows shifting the center of the Gaussian function `exp(-((t-gfs)/gf)2)` along the directly

detected dimension. This dimension is referred to as the f_2 dimension in 2D data sets, the f_3 dimension in 3D data sets, etc. Typical value is `gfs='n'`.

See also: *NMR Spectroscopy User Guide*

Related:

`gf`	Gaussian function in directly detected dimension (P)
`gfs1`	Gaussian shift const. in 1st indirectly detected dimension (P)
`gfs2`	Gaussian shift const. in 2nd indirectly detected dimension (P)

`gfs1` Gaussian shift const. in 1st indirectly detected dimension (P)

Description: Working in combination with the `gf1` parameter, `gfs1` allows shifting the center of the Gaussian function `exp(-((t-gfs1)/gf1)2)` along the first indirectly detected dimension. This dimension is referred to as the f_1 dimension in multidimensional data sets. `gfs1` works analogously to the parameter `gfs`. The "conventional" parameters (i.e., `lb`, `gf`, etc.) operate on the detected FIDs, while this "2D" parameter is used during processing of the interferograms.

See also: *NMR Spectroscopy User Guide*

Related:

`gf`	Gaussian function in directly detected dimension (P)
`gf1`	Gaussian function in 1st indirectly detected dimension (P)
`gfs`	Gaussian shift const. in directly detected dimension (P)

`gfs2` Gaussian shift const. in 2nd indirectly detected dimension (P)

Description: Working in combination with the `gf2` parameter, `gfs2` allows shifting the center of the Gaussian function `exp(-((t-gfs2)/gf2)2)` along the second indirectly detected dimension. This dimension is referred to as the f_2 dimension in multidimensional data sets. `gfs2` works analogously to the parameter `gfs`. The `wti` program can be used to set `gfs2` on the 2D interferogram data.

See also: *NMR Spectroscopy User Guide*

Related:

`gf`	Gaussian function in directly detected dimension (P)
`gf2`	Gaussian function in 2nd indirectly detected dimension (P)
`gfs`	Gaussian shift const. in directly detected dimension (P)
`wti`	Interactive weighting (C)

`Ghmbc` Convert the parameter to a gradient HMBC experiment (M)

Applicability: Systems with a pulsed field gradient module.

Description: Prepares an experiment for a PFG (pulsed field gradient) HMQC.

Arguments: *NMR Spectroscopy User Guide*

`ghmqc` Set up a PFG HMQC pulse sequence (M)

Applicability: Systems with a pulsed field gradient module.

Description: Prepares an experiment for a PFG (pulsed field gradient) HMQC using the sequence GHMQC. The sequence sets three gradients, all separately.

Arguments: *NMR Spectroscopy User Guide*

`Ghmqc` Convert the parameter to a gradient HMQC experiment (M)

Description: Convert the parameter to a gradient HMQC experiment

gHMQC15 **Set up parameters for ^{15}N gHMQC experiment (M)**

Description: Converts the current parameter set to a gHMQC experiment for ^{15}N.

gHMQC_d2 **Set up parameters for ^{15}N gHMQC experiment using dec. 2 (M)**

Description: Converts the current parameter set to a gHMQC experiment for ^{15}N with decoupler 2 as ^{15}N.

gHMQC_d213 **Set up parameters for ^{13}C gHMQC experiment using dec. 2 (M)**

Description: Converts the current parameter set to a gHMQC experiment for ^{13}C with decoupler 2 as ^{13}C.

ghmqcps **Set up a PFG HMQC phase-sensitive pulse sequence (M)**

Applicability: Systems with a pulsed field gradient module.

Description: Prepares an experiment for a PFG (pulsed field gradient) HMQC, phase-sensitive version.

See also: *NMR Spectroscopy User Guide*

ghsqc **Set up a PFG HSQC pulse sequence (M)**

Applicability: Systems with a pulsed field gradient module.

Syntax: `ghsqc<(nucleus)>`

Description: Converts a 1D standard two-pulse sequence parameter set into a parameter set ready to run a PFG (pulsed field gradient) HSQC experiment, either absolute value or phase sensitive.

Arguments: `nucleus` is 13C or 15N. The default is 13C.

See also: *NMR Spectroscopy User Guide*

Ghsqc **Convert the parameter to a gradient HSQC experiment (M)**

Description: Convert the parameter to a gradient HSQC experiment.

gHSQC15 **Set up parameters for ^{15}N gHSQC experiment (M)**

Description: Converts the current parameter set to a gHSQC experiment for ^{15}N.

gHSQC_d2 **Set up parameters for ^{15}N gHSQC experiment using dec. 2 (M)**

Description: Converts the current parameter set to a gHSQC experiment for ^{15}N with decoupler 2 as ^{15}N.

gHSQC_d213 **Set up parameters for ^{13}C gHSQC experiment using dec. 2 (M)**

Description: Converts the current parameter set to a gHSQC experiment for ^{13}C with decoupler 2 as ^{13}C.

Ghsqctoxy **Convert parameters for gradient HSQCTOXY experiment (M)**

Description: Convert the parameter to a gradient HSQCTOXY experiment

G

gilson — Open the Gilson Liquid Handler window (C)

Syntax: `gilson`

Description: Opens the Gilson Liquid Handler window, which enables setup, configuration, and operation of the VAST automatic sampler changer accessory.

See also: *NMR Spectroscopy User Guide*

gin — Return current mouse position and button values (C)

Applicability: All

Syntax: `gin<(Bn_<press><release>)>:$x,$y,$b1,$b2,$b3`

Description: The `gin` command reports the pointer position in relationship to the graphics window and is often used with the move and draw commands. The variables `$x` and `$y` are the x and y positions hold the pointer in millimeters. The variables `$b1`, `$b2`, and `$b3` hold the values for the state of the left, middle, and right mouse buttons.

Values: `$x` is the value in the *x* direction, in millimeters, of the pointer. The range of `x` is 0 at the left edge of the chart and `wcmax` at the right edge. A value of -1 is returned if the pointer position is outside the graphics window along the x axis.

`$y` is the position of the pointer along the y axis. The range of y is -20 at the bottom of the chart to `wc2max` at the top. A value of 10000 is returned if the pointer position is outside the graphics window along the y axis.

`$b1` is the state of left button; returns the value 0 if released and 1 if pressed.

`$b2` is the of middle button; returns the value 0 if released and 1 if pressed.

`$b3` is the of right button; returns the value 0 if released and 1 if pressed.

Arguments: `no argument`, returns current mouse positions and button values.

`Bn_press`, `n=a,1,2,` or `3`. Wait for mouse button (any, 1, 2, or 3) or any key to be pressed.

`Bn_release`, `n=a,1,2,` or `3`. Wait for mouse button (any, 1, 2, or 3) to be released or any key to be pressed.

Examples:

```
gin('B3_press'):$x,$y,$b1,$b2,$b3
```
wait until button 3or any key is pressed

```
gin('Ba_press'):$x,$y,$b1,$b2,$b3
```
wait until any button or any key is pressed

```
gin('B1_release'):$x,$y,$b1,$b2,$b3
```
wait until button 1 is released or any key pressed

```
gin('B2_release'):$x,$y,$b1,$b2,$b3
```
wait until button 2 is released or any key pressed

See also: *User Programming*

Related:

`box`	Draw a box on a plotter or graphics display (C)
`draw`	Draw line from current location to another location (C)
`move`	Move to an absolute location to start a line (C)

globalauto — Automation directory name (P)

Applicability: *VnmrJ Walkup* and systems with automation such as sample handling.

Description: A global parameter that specifies the name of a directory in which the daily automation directories or study directories are saved. This parameter is created and used by the `walkup` macro and the VnmrJ Walkup interface.

See also: *NMR Spectroscopy User Guide; VnmrJ Walkup*

Related:
- `cqinit` Initialize liquids study queue (M)
- `walkup` Walkup automation (M)

glue — Create a pseudo-2D dataset (M)

Applicability: Systems with the LC-NMR accessory.

Syntax: `glue<(num_scans)>`

Description: Steps through the series of FIDs, putting them into `exp5` one by one as an array, and then jumps to `exp5` and changes the parameters `arraydim`, `ni`, and `fn1`, so that the data appear to the user to be a 2D experiment, which can then be processed and displayed with standard 2D commands (`wft2d`, `dconi`, etc.). The parameter `savefile` should exist and should contain the base file name to which a series of FIDs have been saved as `savefile.001`, `savefile.002`, etc.

Arguments: `num_scans` is the number of FIDs copied into the `exp5` array. Typically, `num_scans` is used if the experiment was aborted prematurely, so that the complete `num_scans` worth of FIDs were not actually acquired.

See also: *NMR Spectroscopy User Guide*

Related:
- `savefile` Base file name for saving FIDs or data sets (P)

gmapshim — Start gradient autoshimming (M)

Applicability: Systems with gradient shimming installed.

Syntax: `gmapshim<('files'|'mapname'|'quit')>`

Description: Starts gradient autoshimming if no arguments are used. It can also retrieve a shimmap file or quit gradient autoshimming. When the `gmapshim` macro is done, it automatically exits, and the previous data set is retrieved.

Arguments: `'files'` is a keyword to enter the gradient autoshimming files menu.

`'mapname'` is a keyword to display the current mapname.

`'quit'` is a keyword to exit from gradient autoshimming and retrieve the previous data set.

See also: *NMR Spectroscopy User Guide*

Related:
- `gmapsys` Run gradient autoshimming, set parameters, map shims (M)
- `gmapz` Get parameters and files for `gmapz` pulse sequence (M)

gmapshim_au — Start acquisition with gradient shimming (M)

Applicability: Systems with gradient shimming installed.

Description: If `wshim` is not set to `'n'`, `gmapshim_au` checks the probe file for a lock gradient map name. If the name exists, `gmapshim_au` executes `gmapshim('glideau')` to start gradient shimming followed by acquisition. If the map name does not exist, `gmapshim_au` starts acquisition by running `au('wait')`.

gmapspin — Enable or disable spinning during gradient shimming (P)

Description: Specifies whether or not sample spinning during gradient shimming is enabled. If spinning is enabled during gradient shimming, the pulses and delays *must* also be synchronized with the rotor period.

Values: 'n' disable spinning during gradient shimming.
'y' enable spinning during gradient shimming.

Related:

gmapz	Get parameters and files for gmapz pulse sequence (M)
gmapsys	Run gradient autoshimming, set parameters, map shims (M)
gzsize	Number of z-axis shims used by gradient shimming (P)
spin	Sample spin rate (P)

gmapsys — Run gradient autoshimming, set parameters, map shims (M)

Applicability: Systems with gradient shimming installed.

Syntax: (1) `gmapsys<(option)>`
(2) `gmapsys('shimmap'<,shimmap_option>)`

Description: Enters the Gradient Shimming Setup panel for setting parameters, mapping the shims, and performing autoshimming. This is the only entry point to the gradient shimming Setup panel.

If the gmapz pulse sequence is not loaded, retrieve parameters from the last shimmap used (or current mapname) or from `gmapz.par` if no shimmap exists.

Arguments: `option` is one of the following keywords:

- `'addpar'` adds gradient shimming parameters to the current parameter set.
- `'findgzlvl'` runs an experiment to calibrate `gzlvl`, `gzwin`, and `tof` to optimize the spectral window.
- `'findgzwin'` runs an experiment to calibrate `gzwin` and `tof` to optimize the spectral window.
- `'findtof'` runs an experiment to center `tof` to optimize the spectral window.
- `'rec'` displays the record of shim adjustments from the previous gradient shimming run.
- `'shim'` start autoshimming (same as Gradient Autoshim on Z button).
- `'vi'` edits the file `gshim.list`, which is used for editing shim offsets, `mapname`, or selecting coarse and fine shims.
- `'writeb0'` displays the `b0` plot calculated from the first two array elements.

`'shimmap'` is a keyword to run a shim mapping experiment and save the results (same as Make Shimmap button).

`shimmap_option` is one of the following values:

- `'auto'` is a keyword to calibrate `gzwin` and then make a shimmap (same as Automake Shimmap button).
- `'manual'` is a keyword to use shim offset values set manually from the file `gshim.list` and not the default values to make a shimmap.
- `'overwrite'` is a keyword to make a shimmap and overwrite the current `mapname` if it exists.
- `mapname` is the prefix of the shimmap file name. The default is the user is queried for `mapname` before running the experiment.

See also: *NMR Spectroscopy User Guide*

Related:

gmapshim	Start gradient autoshimming (M)
gmapz	Get parameters and files for `gmapz` pulse sequence (M)

gradtype	Gradients for X, Y, Z axes (P)
gzwin	Spectral width percentage used for gradient shimming (P)
seqfil	Pulse sequence name (P)
gmap_z1z4	Gradient shimming flag to first shim z1-z4 (P)
gzsize	Number of z-axis shims used by gradient shimming (P)

gmapz — Get parameters and files for gmapz pulse sequence (M)

Applicability: Systems with gradient shimming installed.

Syntax: `gmapz<(mapname)>`

Description: Retrieves gradient shimming parameters to set up a gradient shimming experiment.

Arguments: `mapname` is the name of a gradient shimmap file that must exist in the `shimmaps` directory. `gmapz` retrieves parameters and loads the shimmap file from `mapname`. The default is to retrieve standard gradient shimming parameters from the file `gmapz.par`.

See also: *NMR Spectroscopy User Guide*

Related:

gmapshim	Start gradient autoshimming (M)
gmapsys	Run gradient autoshimming, set parameters, map shims (M)
gmap_z1z4	Gradient shimming flag to first shim z1-z4 (P)

gmap_findtof — Gradient shimming flag to first find tof (P)

Applicability: Systems with gradient shimming installed.

Description: When the flag is set to `'y'`, gradient shimming first performs a calibration to find `tof` before the start of shimming. This action is recommended for only homospoil deuterium gradient shimming with different solvents. The default value is `'n'`.

Values: `'y'` turns on the flag.
`'n'` turns off the flag.

See also: *NMR Spectroscopy User Guide*

Related:

gmapshim	Start gradient autoshimming (M)
gmapsys	Run gradient autoshimming, set parameters, map shims (M)
gmapz	Get parameters and files for gmapz pulse sequence (M)
tof	Frequency offset for observe transmitter (P)

gmap_z1z4 — Gradient shimming flag to first shim z1-z4 (P)

Applicability: Systems with gradient shimming installed.

Description: When the flag is set to `'y'`, if `gzsize` is greater than 4, gradient shimming first shims on z1-z4, and then uses all shims specified by `gzsize`. When the flag is set to `'n'`(default), all shims specified by `gzsize` are used.

Values: `'y'` turns on the flag.
`'n'` turns off the flag.

See also: *NMR Spectroscopy User Guide*

Related:

gmapshim	Start gradient autoshimming (M)
gmapsys	Run gradient autoshimming, set parameters, map shims (M)
gmapz	Get parameters and files for gmapz pulse sequence (M)
gzsize	Number of z-axis shims used by gradient shimming (P)

G

gmax — Maximum gradient strength (P)

Description: The allowed maximum gradient level (absolute value) in gauss/cm. gmax is one of the calibration entries in a gradtables file. gxmax, gymax, and gzmax are used when the maximum gradient level is different for each axis in gauss/cm, which is the case for triple-axis PFG coils.

See also: *VnmrJ Installation and Administration*; *VnmrJ Imaging NMR*

Related:

gcoil	Current gradient coil (P)
gxmax,gymax,gzmax	Maximum gradient strength for each axis (P)
sysgcoil	System gradient coil (P)

gmqcosy — Set up PFG absolute-value MQF COSY parameter set (M)

Applicability: Systems with the pulsed field gradient module.

Description: Converts a 1D standard two-pulse sequence parameter set into a parameter set ready to run a PFG (pulsed field gradient) absolute-value MQF COSY experiment.

See also: *NMR Spectroscopy User Guide*

gnoesy — Set up a PFG NOESY parameter set (M)

Applicability: Systems with the pulsed field gradient module.

Description: Converts a 1D standard two-pulse sequence parameter set into a parameter set ready to run a PFG (pulsed field gradient) NOESY experiment, either absolute value or phase sensitive.

See also: *NMR Spectroscopy User Guide*

go — Submit experiment to acquisition (M)

Syntax:
```
go<(<'acqi'><,'nocheck'><,'nosafe'><,'next'>
   <,'sync'><,'wait'>)>
```

Description: Performs the experiment described by the current acquisition parameters, checking parameters loc, spin, gain, wshim, load, and method to determine the necessity to perform various actions in addition to data acquisition. This may involve a single FID or multiple FIDs, as in the case of arrays or 2D experiments. go acquires the FID and performs no processing. If free disk space is insufficient for the complete 1D or 2D FID data set to be acquired, go prompts the user with an appropriate message and aborts the acquisition initiation process.

Before starting the experiment, go executes two user-created macros if they exist. The first is usergo, a macro that allows the user to set up general conditions for the experiment. The second is a macro whose name is formed by go_ followed by the name of the pulse sequence (from seqfil) to be used (e.g., go_s2pul, go_dept). The second macro allows a user to set up experiment conditions suited to a particular sequence.

Arguments: 'acqi' is a keyword to submit an experiment for display by the acqi program. All operations explained above are performed, except acquisition of data is not initiated. The instructions to control data acquisition are stored so that acqi can acquire the data when the FID button is clicked. The gf macro is recommended instead of running go('acqi') directly. Using gf prevents certain acquisition events from occurring, such as spin control and temperature change. See the description of gf for more information.

'nocheck' is a keyword to override checking if there is not enough free disk space for the complete 1D or 2D FID data set to be acquired.

'nosafe' is a keyword to disable probe protection during the experiment.

'next' is a keyword to put the experiment started with go('next') at the head of the queue of experiments to be submitted to the acquisition system. If go('next') is entered, the go macro remains active until the experiment is submitted to the acquisition system, and no other VnmrJ commands are processed until the go macro finishes.

'sync' is a keyword in nonautomation mode that accomplishes the same effect as go('next') in synchronizing VnmrJ command execution with the submission of experiments to the acquisition system. The difference is that 'sync' does not put the experiment at the head of the queue.

'wait' is a keyword to stop submission of experiments to acquisition until wexp processing of the experiment, started with go('wait'), is finished.

Examples:
```
go
go('nosafe')
go('next')
```

See also: *NMR Spectroscopy User Guide*

Related:

acqi	Interactive acquisition display process (C)
au	Submit experiment to acquisition and process data
change	Submit a change sample experiment to acquisition (M)
gain	Receiver gain (P)
ga	Submit experiment to acquisition and FT the result (C)
gf	Prepare parameters for FID/spectrum display in acqi (M)
go_	Pulse sequence setup macro called by go, ga, and au (M)
load	Load status of displayed shims (P)
loc	Location of sample in tray (P)
lock	Submit an Autolock experiment to acquisition (C)
method	Autoshim method (P)
probe_protection	Probe protection control (P)
sample	Submit change sample, Autoshim exp. to acquisition (M)
seqfil	Pulse sequence name (P)
shim	Submit an Autoshim experiment to acquisition (C)
spin	Submit a spin setup experiment to acquisition (C)
spin	Sample spin rate (P)
su	Submit a setup experiment to acquisition (M)
usergo	Experiment setup macro called by go, ga, and au (M)
vnmrjcmd()	Commands to invoke the GUI popup (C)
wshim	Conditions when shimming is performed (P)

go_ — Pulse sequence setup macro called by go, ga, and au (M)

Syntax: go_*macro*

Description: Called by the macros go, ga, or au before starting an experiment. The user typically creates this macro to set up general experiment conditions. The name of the macro is formed by combining go_ with the name of the pulse sequence macro (from seqfil) to be used.

Examples:
```
go_dept
go_noesy
go_s2pul
```

See also: *NMR Spectroscopy User Guide*

Related:

au	Submit experiment to acquisition and process data (M)
ga	Submit experiment to acquisition and FT the result (M)

go	Submit experiment to acquisition (M)
seqfil	Pulse sequence name (P)
usergo	Experimental setup macro called by go, ga, and au (M)

gpat-gpat3 Gradient shape (P)

Description: Predefined string parameters available to specify gradient shapes.

See also: *VnmrJ Imaging NMR*

gplan Start interactive image planning (C)

Syntax: `gplan(function_name, arg1, arg2,...)`

Description: In VnmrJ, starts an image planning session.

Arguments: `'function_name',path` is the name of an image planning function surrounded by single quotation marks.

`arg1, arg2,...` are arguments for the function, if relevant.

Examples:
```
gplan 'clearStacks()'
get 'PrevStacks()'
```

See also: *NMR Spectroscopy User Guide*

gradientdisable Disable PFG gradients (P)

Description: `gradientdisable` is an optional global parameter for disabling the gradient pulses. If `gradientdisable` parameter is set to `'y'`, the psg software sets the gradient dac values to 0. The gradient parameters in VnmrJ and pulse sequence are not altered. This feature works in both C psg and SpinCAD Jpsg.

To use this feature, create `gradientdisable` as a global parameter of type `'flag'`. If gradientdisable is set to `'y'`, the gradient amplitude values will be set to 0; if set to `'n'` the gradient amplitudes will be the expected values determined by the gradient parameters and pulse sequence calculations. This feature is typically used in experiments involving Cold Probes. This feature is only effective for gradient configurations, `gradtypes` of `'l'`, `'p'`, and `'t'`.

Related:	pfgon	Pulsed field gradient amplifiers on/off control (P)
	gradtype	Gradients for X, Y, and Z axes (P)

gradientshaping Activate shaping on the gradient pulses (P)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Activate shaping on the gradient pulses in the pulse sequence without changing the pulse sequence source program. This feature works only the Z gradient pulses, specified using the `zgradpulse(..)` PSG statement. gradientshaping is a global parameter.

Values: `gradientshaping='y'` enables this feature and produces a WURST shaping of gradient amplitudes.
`gradientshaping='n'` or destroy the parameter disables this feature and produces rectangular gradients amplitudes.

gradstepsz Gradient step size (P)

Description: The maximum gradient DAC value. `gradstepsz` determines the type of gradient DAC board used in the system: 12-bit or 16-bit. It is used internally to convert gauss/cm gradient levels to the proper hardware DAC level.

Values: Systems with 12-bit DACs (older SISCO spectrometers without gradient waveform capabilities): –2047 to +2047 units, in integer steps.

Systems with 16-bit DACs (SISCO spectrometers with gradient waveform capabilities): –32767 to +32767 units, in integer steps.

See also: *VnmrJ Installation and Administration*; *VnmrJ Imaging NMR*

gradtype — Gradients for X, Y, and Z axes (P)

Applicability: Systems with pulsed field gradient (PFG) or imaging capability.

Description: Configuration parameter for systems with optional gradients for axes. The value is set using the label X Axis, Y Axis, Z Axis in the Spectrometer Configuration window (opened from `config`). The values available for each axis are None, WFG + GCU, Performa I, Performa II/III, Performa II/III + WFG, Performa XYZ, Performa XYZ + WFG, SIS (12 bit), Homospoil, and Shim DAC. WFG stands for the waveform generator; GCU stands for the gradient compensation unit; and Performa I, II, III, and XYZ are types of PFG modules.

Values: String of three characters (e.g., `'nnp'`). The first character is the gradient for the X axis, second for the Y axis, and third for the Z axis. Each axis has value `'n'` (None choice in Spectrometer Configuration window), `'w'` (WFG+GCU), `'l'` (Performa I), `'p'` (Performa II/III), `'q'` (Performa II/III + WFG), `'t'` (Performa XYZ), `'u'` (Performa XYZ + WFG), `'s'` (SIS (12 bit), or `'h'` (Homospoil). Homospoil is functional only for the Z axis.

See also: *VnmrJ Installation and Administration; NMR Spectroscopy User Guide*

Related:

`config`	Display current configuration and possibly change it (M)
`pfgon`	PFG amplifiers on/off control (P)

graphis — Return the current graphics display status (C)

Syntax: (1) `graphis:$display_command`
(2) `graphis(command):$yes_no`

Description: Determines what command currently controls the graphics window.

Arguments: `$display_command` is a return value set to the name of the currently controlling command.

`command` is the name of a command to be checked.

`$yes_no` is a return value set to 1 if the command name given by the `command` argument is controlling the graphics window, or set to 0 if it is not controlling the window.

Examples:

```
graphis:$display
if ($display='ds') then
...
endif

graphis('ds'):$ds_on
if ($ds_on) then
...
endif
```

See also: *User Programming*

Related:

`textis`	Return the current text display status (C)

G

grayctr — Gray level window adjustment (P)

Description: Controls the grayscale display available in dcon. In the dconi program, the center mouse button controls the grayscale bar, which changes the mean gray level and hence the value of grayctr. The grayctr parameter (along with the parameter graysl) records the current settings of the gray bar as the interaction changes; the value can also be set directly. The right mouse button controls the data level of the maximum data intensity. To create grayctr, enter

```
create('grayctr','real')
setgroup('grayctr','display')
setlimit('grayctr',64,0,1).
```

To create the set of imaging parameters grayctr, dcrmv and graysl, and in the current experiment, enter `addpar('image').`

Values: 0 to 64 (typically 32)

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
dcon	Display noninteractive color intensity map (C)
dconi	Interactive 2D contour display (C)
graysl	Gray level slope (contrast) adjustment (P)

graysl — Gray level slope (contrast) adjustment (P)

Description: Controls the grayscale display available in dcon. In the dconi program, the center mouse button controls the grayscale slope as applied to the data changes and hence the value of graysl. Negative values of graysl will invert black and white; however, negative values can be set only from the keyboard. graysl (along with the parameter grayctr) records the current settings of the gray bar as the interaction changes; the value can also be set directly. The right mouse button controls the data level of the maximum data intensity. To create graysl, enter the following command:

```
create('graysl','real') setgroup('graysl','display')
setlimit('graysl',10,-10,0.1)
```

To create the set of imaging parameters graysl, dcrmv, and grayctr in the current experiment, enter `addpar('image').`

Values: –10 to +10 (–100 to +100, typically 1)

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
dcon	Display noninteractive color intensity map (C)
dconi	Interactive 2D contour display (C)
grayctr	Gray level window adjustment (P)

grecovery — Eddy current testing (M)

Applicability: Systems with pulsed field gradient.

Description: Conditions an experiment for eddy current testing so that it is compatible with standard installation procedures.

See also: *Pulsed Field Gradient Modules Installation, NMR Spectroscopy User Guide*

grid — Draw a grid on a 2D display (M)

Syntax:

```
(1) grid<(<spacing><,><color>)>
(2) grid<(start_f2,incr_f2,start_f1,incr_f1<,color>)>
```

Description: Draws grid lines over a 2D display. Grid lines are drawn on the graphics screen in the XOR mode—entering a second `grid` command with identical arguments erases (not redraws) the grid displayed by the first command.

Arguments: `spacing` specifies the approximate spacing of the grid lines, in cm. The default is intervals of approximately 1 cm, rounded so that the intervals fall at a multiple of 1, 2, or 5 (in Hz), or 1p, 2p, or 5p (in ppm).

`color` specifies the color of the grid lines and is one of the following keywords: `'red'`, `'green'`, `'blue'`, `'cyan'`, `'magenta'`, `'yellow'`, `'black'`, or `'white'`. The default is `'blue'`.

`start_f2`, `incr_f2`, `start_f1`, `incr_f1` define a grid by supplying the starting and increment frequencies for f2 and f1. Add the `p` suffix to a value to enter it in ppm (see third example below).

Examples:
```
grid
grid(1.5,'red')
grid(1p,0.5p,3p,0.5p)
```

See also: *NMR Spectroscopy User Guide*

Related:

`plgrid`	Plot a grid on a 2D plot (M)

groupcopy — Copy parameters of group from one tree to another (C)

Syntax: `groupcopy(from_tree,to_tree,group)`

Description: Copies a set of parameters of a group from one parameter tree to another.

Arguments: `from_tree`, `to_tree` are two different parameter trees, each given by the one of the keywords `'global'`, `'current'`, or `'processed'`. Refer to the `create` command for more information on trees.

`group` is the set of parameters to be copied and is one of the keywords `'all'`, `'sample'`, `'acquisition'`, `'processing'`, and `'display'`.

Examples: `groupcopy('processed','current','acquisition')`

See also: *User Programming*

Related:

`create`	Create new parameter in a parameter tree (C)
`destroy`	Destroy a parameter (C)
`destroygroup`	Destroy parameters of a group in a tree (C)
`display`	Display parameters and their attributes (C)
`setgroup`	Set group of a parameter in a tree (C)

gspoil — Spoiler gradient level (P)

Description: Predefined parameter to set a spoiler gradient level.

gsspat — Slice-select gradient shape (P)

Description: Predefined string parameter to specify a slice-select gradient shape.

gtnnoesy — Set up a PFG TNNOESY parameter set (M)

Applicability: Systems with the pulsed field gradient (PFG) module.

Description: Converts a 1D standard two-pulse sequence parameter set into a parameter set ready to run a PFG NOESY experiment (either absolute value or phase sensitive) or a `gtnnoesy` experiment.

G

gtnroesy **Set up a PFG absolute-value ROESY parameter set (M)**

Applicability: Systems with the pulsed field gradient (PFG) module.

Description: Converts a 1D standard two-pulse sequence parameter set into a parameter set ready to run a PFG absolute-value ROESY experiment or a gtnroesy experiment.

gtotlimit **Gradient total limit (P)**

Applicability: Systems with three-axis gradients

Description: Sets the gradient limit, in gauss/cm, of the *x*, *y*, and *z* axes, summed together. This parameter is taken from an entry of the same name in a gradient table and should only exist if a gradient amplifier limits the combined output of all three gradient axis.

Related		
	gcoil	Read data from gradient calibration tables (P)

gtrim **Trim gradient level (P)**

Description: Predefined parameter to set a trim gradient level.

gxmax,gymax,gzmax **Maximum gradient strength for each axis (P)**

Applicability: Systems with three-axis gradients.

Description: Defines the maximum gradient strength, in gauss/cm, for each gradient axis. These values are read in from the selected system gradient table whenever the parameter set is retrieved or the gradient coil defined by gcoil has changed. When the values are read in, gmax is set to the lowest value of the three.

The parameters gxmax, gymax, and gzmax are used instead of gmax when the gradients strengths are not equal for each axis. Unequal gradient strengths per axis are generally true for systems with three-axis PFG coils, which have a strong *z* gradient, and can be true for microimaging systems. Horizontal-bore imaging systems usually have gradients set to the same maximum value, and gmax can be used.

See also: *NMR Spectroscopy User Guide; User Programming, VnmrJ Imaging NMR*

Related:		
	gcoil	Read data from gradient calibration tables (P)
	gmax	Maximum gradient strength (P)

gzlvl **Pulsed field gradient strength (P)**

Applicability: Systems with gradient shimming installed.

Description: Specifies the pulsed field gradient DAC value.

Values: Range from +2047 to –2048 for 12-bit gradient module, and from +32767 to –32768 for a 16-bit gradient module.

Related:		
	gzsize	Number of z-axis shims used by gradient shimming (P)
	gzwin	Spectral window percentage used for gradient shimming (P)

gzsize **Number of z-axis shims used by gradient shimming (P)**

Applicability: Systems with gradient shimming installed.

Description: Specifies the number of z-axis shims used by gradient shimming. For example, `gzsize` set to 4 means that gradient shimming uses shims z1 to z4. By default, coarse shims are used if present, as determined by the `shimset` value

Values: Integer from 1 to 8.

Related:

`gmapshim`	Start gradient autoshimming (M)
`gmapsys`	Run gradient autoshimming, set parameters, map shims (M)
`gmapz`	Get parameters and files for `gmapz` pulse sequence (M)
`gzlvl`	Pulsed field gradient strength (P)
`gzwin`	Spectral width percentage used by gradient shimming (P)
`shimset`	Type of shimset (P)
`gmap_z1z4`	Gradient shimming flag to first shim z1-z4 (P)

`gzwin` Spectral width percentage used for gradient shimming (P)

Applicability: Systems with gradient shimming installed.

Description: Specifies the percentage of the spectral width `sw` used by gradient shimming for shimmap calculations. The value is set automatically with the buttons Find `gzlvl/gzwin` and Find `gzwin` in the gradient shimming system menu opened by `gmapsys`.

Values: A real number between 0 and 100. The typical value is 50.

Related:

`gmapshim`	Start gradient autoshimming (M)
`gmapsys`	Run gradient autoshimming, set parameters, map shims (M)
`gmapz`	Get parameters and files for `gmapz` pulse sequence (M)
`gzlvl`	Pulsed field gradient strength (P)
`gzsize`	Number of z-axis shims used by gradient shimming (P)
`sw`	Spectral width in directly detected dimension (P)
`tof`	Frequency offset for observe transmitter (P)

G

H

h1	Automated proton acquisition (M)
h1freq	Proton frequency of spectrometer (P)
h1p	Process 1D proton spectra (M)
h2cal	Calculate strength of the decoupler field (C)
halt	Abort acquisition with no error (C)
hc	Automated proton and carbon acquisition (M)
hcapt	Automated proton, carbon, and APT acquisition (M)
hcchtocsy	Set up parameters for HCCHTOCSY pulse sequence (M)
hccorr	Automated proton, carbon, and HETCOR acquisition (M)
hcdept	Automated proton, carbon, and DEPT acquisition (M)
hcosy	Automated proton and COSY acquisition (M)
hdmf	Modulation frequency for the band selective homonuclear decoupling (P)
hcmult	Execute protocol actions of apptype hcmult (M)
hdof	Frequency offset for homodecoupling (P)
hdpwr	Power level for homodecoupling (P)
hdpwrf	Homodecoupling fine power (optional) (P)
hdres	Sets the tip angle resolution (P)
hdseq	Sets the decoupler waveform filename (P)
hdwshim	Hardware shimming (P)
hdwshimlist	List of shims for hardware shimming (P)
het2dj	Set up parameters for HET2DJ pulse sequence (M)
HETCOR	Change parameters for HETCOR experiment (M)
hetcor	Set up parameters for HETCOR pulse sequence (M)
hetcorcp1	Set up parameters for solids HETCOR pulse sequence (M)
hetcorps	Set up parameters for HETCORPS pulse sequence (M)
hetero2d	Execute protocol actions of apptype hetero2d (M)
hidecommand	Execute macro instead of command with same name (C)
hipwrampenable	High Power Amplifier Enable (P)
Hmbc	Convert the parameter to a HMBC experiment (M)
Hmqc	Convert the parameter to a HMQC experiment (M)
HMQC15	Set up parameters for ^{15}N HMQC experiment (M)
HMQC_d2	Set up parameters for ^{15}N HMQC experiment using dec. 2 (M)
HMQC_d213	Set up parameters for ^{13}C HMQC experiment using dec. 2 (M)
hmqcr	Set up parameters for HMQCR pulse sequence (M)
Hmqctoxy	Convert the parameter to a HMQCTOXY experiment (M)
HMQCTOXY15	Set up parameters for ^{15}N HMQCTOXY experiment (M)
HMQCTOXY_d2	Set up parameters for ^{15}N HMQCTOXY using decoupler 2 (M)
HMQCTOXY_d213	Set up parameters for ^{13}C HMQCTOXY using decoupler 2 (M)
hmqctoxy3d	Set up parameters for HMQC-TOCSY 3D pulse sequence (M)
ho	Horizontal offset (P)
hom2dj	Set up parameters for HOM2DJ pulse sequence (M)
homo	Homodecoupling control for the observe channel (P)

H

HOMODEC	Change parameters for HOMODEC experiment (M)
homo2d	Execute protocol actions of apptype homo2d (M)
homorof1	Delay before turning on homo decoupling rf (P)
homorof2	Delay after blanking the amp and setting T/R to receive (P)
homorof3	Delay between setting T/R switch to receive and gating the recvr on (P)
hoult	Set parameters alfa and rof2 according to Hoult (M)
hpa	Plot parameters on special preprinted chart paper (C)
Hprescan	Proton prescan (P))
hregions	Select integral regions in proton spectrum (M)
hs	Homospoil pulses (P)
Hsqc	Convert the parameter to a HSQC experiment (M)
HSQC15	Set up parameters for ^{15}N HSQC experiment (M)
HSQC_d2	Set up parameters for ^{15}N HSQC experiment using dec. 2 (M)
HSQC_d213	Set up parameters for ^{13}C HSQC experiment using dec. 2 (M)
hsqcHT	Set up the hsqcHT experiment (M)
Hsqctoxy	Convert parameters to a HSQCTOXY experiment (M)
HSQCTOXY15	Set up parameters for ^{15}N HSQCTOXY experiment (M)
HSQCTOXY_d2	Set up parameters for ^{15}N HSQCTOXY using decoupler 2 (M)
HSQCTOXY_d213	Set up parameters for ^{13}C HSQCTOXY using decoupler 2 (M)
hsqctoxySE	Set up parameters for HSQC-TOCSY 3D pulse sequence (M)
hsrotor	Display rotor speed for solids operation (P)
hst	Homospoil time (P)
htbitrev	Hadamard bit reversal flag (P)
htbw1	Hadamard pulse excitation bandwidth in ni (P)
htcal1	RF calibration flag for Hadamard waveforms in ni (P)
htfrq1	Hadamard frequency list in ni (P)
htofs1	Hadamard offset in ni (P)
htpwr1	Power level for RF calibration of Hadamard waveforms in ni (P)
htss1	Stepsize for Hadamard waveforms in ni (P)
hzmm	Scaling factor for plots (P)
hztomm	Convert locations from Hz or ppm to plotter units (C)

h1 — Automated proton acquisition (M)

Syntax: `h1<(solvent)>`

Description: Prepares parameters for automatically acquiring a standard ^{1}H spectrum. The parameter `wexp` is set to `'procplot'` for standard processing. If `h1` is used as the command for automation via the `enter` command, then `au` is supplied automatically and should not be entered on the MACRO line of the `enter` program. However, it is possible to customize `h1` on the MACRO line by following it with additional commands and parameters. (e.g., entering `h1 nt=1` uses the standard `h1` setup but with only one transient).

Arguments: `solvent` is the name of the solvent. In automation mode, the solvent is supplied by the `enter` program. The default is `'CDCl3'`.

Examples:
```
h1
h1('DMSO')
```

See also: *NMR Spectroscopy User Guide*

Related:

au	Submit experiment to acquisition and process data (M)
enter	Enter sample information for automation run (C)
h1p	Process 1D proton spectra (M)
procplot	Automatically process FIDs (M)
wexp	When experiment completes (P)

h1freq — Proton frequency of spectrometer (P)

Description: Configuration parameter for the resonance frequency of ^{1}H as determined by the field strength of the magnet. The value is set using the label Proton Frequency in the Spectrometer Configuration window.

Values: 085, 100, 200, 300, 400, 500, 600, 700, 750, 800, 900 (in MHz); 3T, 4T.

See also: *VnmrJ Installation and Administration*

Related:

config	Display current configuration and possibly change it (M)

h1p — Process 1D proton spectra (M)

Description: Processes non-arrayed 1D proton spectra using standard macros. h1p is called by proc1d, but can also be used directly. Fully automatic processing (up to a point where a spectrum could be plotted) is provided: Fourier transformation (using preset weighting functions), automatic phasing (aphx macro), select integral regions (hregions macro), adjust integral size (integrate macro), vertical scale adjustment (vsadjc macro), avoiding excessive noise (noislm macro), threshold adjustment (if required, thadj macro), and referencing to the TMS signal if present (setref macro, then tmsref macro).

See also: *NMR Spectroscopy User Guide*

Related:

aphx	Perform optimized automatic phasing (M)
h1	Automated proton acquisition (M)
hregions	Select integral regions for proton spectra (M)
integrate	Automatically integrate 1D spectrum (M)
noislm	Avoids excessive noise (M)
proc1d	Processing macro for simple (non-arrayed) spectra (M)
setref	Set frequency referencing for proton spectra (M)
thadj	Adjust threshold (M)
tmsref	Reference spectrum to TMS line (M)
vsadjh	Adjust vertical scale for proton spectra (M)

h2cal — Calculate strength of the decoupler field (C)

Syntax: `h2cal<(j1r,j2r<,j0>)><:gammah2,pw90,frequency>`

Description: Calculates the strength of the decoupler field. It uses the results from two experiments: one with the decoupler off-resonance at a lower frequency and the other with the decoupler off-resonance at a higher frequency than the frequency of the peak being decoupled.

Arguments: j1r is the frequency of the decoupler during these two experiments;. The default is that h2cal prompts for a value. If the parameter dof is arrayed and has two values, h2cal assumes these two values represent the decoupler frequencies; if dof is arrayed and has more than two values, h2cal prompts for the two decoupler frequencies.

`j2r` is the reduced coupling constants from the two experiments. The default is that `h2cal` prompts for a value

`j0` is the full coupling constant that results when no decoupling is done. The default is a value of 142 Hz, the constant for the standard sample dioxane, or 15 Hz for the methyl iodide sample.

`gammah2` is a return value set to the strength of the decoupler field.

`pw90` is a return value set to the pulse width of a 90° pulse from the decoupler. It is related to the value of parameter `dmf` through the equation `dmf=1/pw90`.

`frequency` is a return value set to the coalescence point (i.e., frequency at which single-frequency decoupling would collapse the dioxane to a singlet).

See also: *NMR Spectroscopy User Guide*

Related:

`dmf`	Decoupler modulation frequency for first decoupler (P)
`dof`	Frequency offset for first decoupler (P)

`halt` Abort acquisition with no error (C)

Syntax: `halt`

Description: Aborts an experiment that has been submitted to acquisition. If the experiment is active, it is aborted immediately, all data is discarded, and the experiment is interpreted as complete. Any data collected from an earlier block size transfer is retained. If any `wexp` processing is defined, that processing then occurs, followed by any queued experiments. The login name, and the FID directory path in `file` are used as keys to find the proper experiment to abort.

Under some circumstances, there is a delay between the time `go` is entered and the acquisition is started. During this time, instructions based on the selected pulse sequence are being generated. This is signified by the letters “PSG” appearing in the upper left corner of the status window. A `halt` command issued under these circumstances reports that no acquisition is active but it instead stops the instruction generation process and displays “PSG aborted”.

See also: *NMR Spectroscopy User Guide*

Related:

`aa`	Abort acquisition with error (C)
`file`	File name of parameter set (P)
`go`	Submit experiment to acquisition (C)
`wexp`	Specify action when experiment completes (C)
`wexp`	When experiment completes (P)

`hc` Automated proton and carbon acquisition (M)

Syntax: `hc<(solvent)>`

Description: Combines the operation of the `h1` and `c13` macros. In non-automation mode, both spectra are acquired in the experiment in which the `hc` macro was entered. After the completion of the acquisition, `rttmp` can be used for further processing of the two spectra.

Arguments: `solvent` is the solvent name In automation mode, the `enter` program supplies the value. In non-automation mode, the default is `'cdcl3'`.

Examples:

```
hc
hc('dmso')
```

See also: *NMR Spectroscopy User Guide*

Related:

`c13`	Automatic carbon acquisition (M)
`enter`	Enter sample information for automation run (M,U)
`h1`	Automated proton acquisition (M)
`rttmp`	Retrieve experiment data from experiment subfile (M)

hcapt — Automated proton, carbon, and APT acquisition (M)

Syntax: `hcapt<(solvent)>`

Description: Combines the operation of the `h1` and `c13` macros and the APT experiment. In non-automation mode, all spectra are acquired in the experiment in which the `hcapt` macro was entered. After acquisition completes, `rttmp` can be used for further processing of the three spectra.

Arguments: `solvent` is the solvent name. In automation mode, the `enter` program supplies the value. In non-automation mode, the default is `'cdcl3'`.

Examples:
```
hcapt
hcapt('dmso')
```

See also: *NMR Spectroscopy User Guide*

Related:

`Apt`	Set up parameters for APT experiment (M)
`c13`	Automatic carbon acquisition (M)
`enter`	Enter sample information for automation run (M,U)
`h1`	Automated proton acquisition (M)
`rttmp`	Retrieve experiment data from experiment subfile (M)

hcchtocsy — Set up parameters for HCCHTOCSY pulse sequence (M)

Description: Used for sidechain assignments in fully ^{13}C-enriched molecules.

See also: *NMR Spectroscopy User Guide*

hccorr — Automated proton, carbon, and HETCOR acquisition (M)

Syntax: `hccorr<(solvent)>`

Description: Combines the operation of the `h1` and `c13` macros and the HETCOR experiment. In non-automation mode, all spectra are acquired in the experiment in which `hccorr` is entered. After acquisition completes, `rttmp` can be used for further processing of the three spectra.

Arguments: `solvent` is the solvent name. In automation mode, the `enter` program supplies the value. In non-automation mode, the default is `'cdcl3'`.

Examples:
```
hccorr
hccorr('dmso')
```

See also: *NMR Spectroscopy User Guide*

Related:

`c13`	Automated carbon acquisition (M)
`enter`	Enter sample information for automation run (M,U)
`h1`	Automated proton acquisition (M)
`hetcor`	Set up parameters for HETCOR experiment (M)
`rttmp`	Retrieve experiment data from experiment subfile (M)

hcdept — Automated proton, carbon, and DEPT acquisition (M)

Syntax: `hcdept<(solvent)>`

Description: Combines the operation of the `h1` and `c13` macros and the DEPT experiment. In non-automation mode, all spectra are acquired in the experiment in which `hcdept` was entered. After the completion of the acquisition, `rttmp` can be used for further processing of the three spectra.

Arguments: `solvent` is the solvent name. In automation mode, the `enter` program supplies the value. In non-automation mode, the default is `'cdcl3'`.

Examples: `hcdept`
`hcdept('dmso')`

See also: *NMR Spectroscopy User Guide*

Related:

`c13`	Automatic carbon acquisition (M)
`Dept`	Set up parameters for DEPT experiment (M)
`enter`	Enter sample information for automation run (M,U)
`h1`	Automated proton acquisition (M)
`rttmp`	Retrieve experiment data from experiment subfile (M)

`hcosy` Automated proton and COSY acquisition (M)

Syntax: `hcosy<(solvent)>`

Description: Combines the operation of the `h1` macro and the COSY experiment. In non-automation mode, both spectra are acquired in the experiment in which `hcosy` is entered. After acquisition completes, `rttmp` can be used for further processing of the two spectra.

Arguments: `solvent` is the solvent name. In automation mode, the `enter` program supplies the value. In non-automation mode, the default is `'cdcl3'`.

Examples: `hcosy`
`hcosy('dmso')`

See also: *NMR Spectroscopy User Guide*

Related:

`enter`	Enter sample information for automation run (C)
`h1`	Automated proton acquisition (M)
`rttmp`	Retrieve experiment data from experiment subfile (M)

`hdmf` Modulation frequency for homonuclear decoupling (P)

Applicability: VNMRS liquids, 400 MR

Syntax: `hdmf=<value>`

Description: Sets the modulation frequency for the band selective homonuclear decoupling. The parameter specifies `1/pw90` at the power value, `hdpwr`, used for homonuclear decoupling. The parameter is not used with single frequency homonuclear decoupling.

Related:

`dutyc`	The rf duty cycle fraction for homonuclear decoupling (P)
`hdof`	Frequency offset for homodecoupling (P)
`hdpwr`	Sets the rf attenuator to control the power for homonuclear decoupling (P)
`hdpwrf`	Sets the rf linear modulator fine power for homonuclear decoupling (P)
`hdres`	Sets the tip angle resolution (P)
`hdseq`	Sets the decoupler waveform filename (P)
`homo`	Homodecoupling control for observe channel (P)
`homorof1`	Delay before turning on homo decoupling rf (P)
`homorof2`	Delay after blanking the amplifier and setting T/R switch to receive (P)
`homorof3`	Delay between setting T/R switch to receive gating on the receiver (P)
`tn`	Nucleus for observe transmitter (P)

`hcmult` Execute protocol actions of apptype hcmult (M)

Description: This macro is used to execute the protocol actions of the hcmult apptype.

Examples: `hcmult('setup')` – execute hcmult experimental setup
`hcmult('process')` – execute hcmult processing
`hcmult('plot')` – execute hcmult plotting

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:

`apptype`	Application type (P)
`execpars`	Set up the exec parameters (M)

hdof — Frequency offset for homodecoupling (P)

Applicability: VNMRS systems

Syntax: `hodf=<value>`

Description: Sets the irradiation frequency offset for homonuclear decoupling and similar to how `tof`, and `dof` determine the frequency. The parameter is not used if `hdseq` is set to a filename.

Values: –100000 to 100000 Hz in steps of 0.1 Hz.

Related:

`dutyc`	The rf duty cycle fraction for homonuclear decoupling (P)
`hdmf`	modulation frequency for the band selective homonuclear decoupling (P)
`hdpwr`	Sets the rf attenuator to control the power for homonuclear decoupling (P)
`hdpwrf`	Homodecoupling fine power (optional) (P)
`hdres`	Sets the tip angle resolution (P)
`hdseq`	Sets the decoupler waveform filename (P)
`homo`	Homodecoupling control for observe channel (P)
`homorof1`	Delay before turning on homo decoupling rf (P)
`homorof2`	Delay after blanking the amplifier and setting T/R switch to receive (P)
`homorof3`	Delay between setting T/R switch to receive gating on the receiver (P)
`tn`	Nucleus for observe transmitter (P)

hdpwr — Power level for homodecoupling (P)

Applicability: VNMRS systems, 400 MR

Syntax: `hdpwr=<value>`

Description: Sets the rf attenuator to control the power for homonuclear decoupling. The `dutyc` parameter must be accounted for when setting `hdpwr`.

Values: -16 to 50 dB

CAUTION: **Homodecoupling power greater than 2 watts in a switchable probe will damage the probe. Always carefully calibrate homodecoupling to avoid exceeding 2 watts. The maximum value for hdpwr is set to 49, corresponding to about 2 watts of power. The actual power delivered depends on the CW duty cycle. Before using close to the maximum value of power or duty cycle, ensure safe operation by measuring the output power.**

Related:

`dutyc`	The rf duty cycle fraction for homonuclear decoupling (P)
`hdmf`	modulation frequency for the band selective homonuclear decoupling (P)
`hdof`	Frequency offset for homodecoupling (P)
`hdpwrf`	Homodecoupling fine power (optional) (P)
`hdres`	Sets the tip angle resolution (P)
`hdseq`	Sets the decoupler waveform filename (P)

homo	Homodecoupling control for observe channel (P)
homorof1	Delay before turning on homo decoupling rf (P)
homorof2	Delay after blanking the amplifier and setting T/R switch to receive (P)
homorof3	Delay between setting T/R switch to receive gating on the receiver (P)
tn	Nucleus for observe transmitter (P)

hdpwrf — Homodecoupling fine power (optional) (P)

Applicability: VNMRS liquids systems

Syntax: `hdpwrf=<value>`

Description: Sets the rf linear modulator fine power for homonuclear decoupling. The default is 4095 if the variable does not exist. Attenuation is added to the attenuation set by hdpwr.

Values: 0-4095

Related:

dutyc	The rf duty cycle fraction for homonuclear decoupling (P)
hdmf	Modulation frequency for the band selective homonuclear decoupling (P)
hdof	Frequency offset for homodecoupling (P)
hdpwr	Sets the rf attenuator to control the power for homonuclear decoupling (P)
hdres	Sets the tip angle resolution (P)
hdseq	Sets the decoupler waveform filename (P)
homo	Homodecoupling control for observe channel (P)
homorof1	Delay before turning on homo decoupling rf (P)
homorof2	Delay after blanking the amplifier and setting T/R switch to receive (P)
homorof3	Delay between setting T/R switch to receive gating on the receiver (P)
tn	Nucleus for observe transmitter (P)

hdres — Sets the tip angle resolution (P)

Applicability: VNMRS liquids systems

Syntax: `hdres=<value>`

Description: Sets the tip angle resolution to be used for the band selective waveform mode of homonuclear decoupling. The parameter is not used with single frequency homonuclear decoupling.

Values: 1 to 90 in units of degrees with 1 degree resolution

Related:

dutyc	The rf duty cycle fraction for homonuclear decoupling (P)
hdmf	Modulation frequency for the band selective homonuclear decoupling (P)
hdof	Frequency offset for homodecoupling (P)
hdpwr	Sets the rf attenuator to control the power for homonuclear decoupling (P)
hdpwrf	Sets the rf linear modulator fine power for homonuclear decoupling (P)
hdseq	Sets the decoupler waveform filename (P)
homo	Homodecoupling control for observe channel (P)
homorof1	Delay before turning on homo decoupling rf (P)
homorof2	Delay after blanking the amplifier and setting T/R switch to receive (P)
homorof3	Delay between setting T/R switch to receive gating on the receiver (P)
tn	Nucleus for observe transmitter (P)

hdseq — Waveform filename for band selective decoupling (P)

Applicability: VNMRS liquids systems

Syntax: `hdseq='filename'` — the file must have a `.DEC` extension.

Description: Sets the decoupler waveform filename (.DEC extension) for the band selective waveform mode. The irradiation frequency is determined by the transmitter offset last applied to the observe channel in the pulse sequence (typically `tof`) and any additional frequency offset from any phase modulation programmed implicitly into the waveform .DEC file.

Examples: `hdseq=''` or does not exist — single frequency decoupling is used.

Related:

dutyc	
hdmf	modulation frequency for the band selective homonuclear decoupling (P)
hdof	Frequency offset for homodecoupling (P)
hdpwr	Sets the rf attenuator to control the power for homonuclear decoupling (P)
hdpwrf	Sets the rf linear modulator fine power for homonuclear decoupling (P)
hdres	Sets the tip angle resolution (P)
homo	Homodecoupling control for observe channel (P)
homorof1	Delay before turning on homo decoupling rf (P)
homorof2	Delay after blanking the amplifier and setting T/R switch to receive (P)
homorof3	Delay between setting T/R switch to receive gating on the receiver (P)
tn	Nucleus for observe transmitter (P)

hdwshim — Hardware shimming (P)

Applicability: Systems with additional Z1 shimming hardware.

Description: Allows go, su, au, etc., to turn on and off shimming hardware. Hardware shimming is automatically suspended during software autoshimming. Hardware shimming is only active during acquisition (`go`, `ga`, `au`). `hdwshim` is a global parameter, so it affects all experiments.

Values: `'y'` turns hardware shimming on.

`'p'` turns hardware shimming on during presaturation pulse (power level change followed by pulse).

`'n'` turns shimming off.

See also: *NMR Spectroscopy User Guide*

Related:

au	Submit experiment to acquisition and process data (C)
go	Submit experiment to acquisition (C)
su	Submit a setup experiment to acquisition (M)
ga	Submit experiment to acquisition and FT the result (M)

hdwshimlist — List of shims for hardware shimming (P)

Description: A global parameter that sets the shims to use during hardware shimming. If it does not exist, hardware shimming uses `z1` by default. To create the parameter, use `create('hdwshimlist','string','global')`.

Values: Any string composed of `z1`, `z1c`, `z2`, `z2c`, `x1`, `y1`. Commas and blank space are ignored. Shimming is done in the order z1, z2, x1, y1, regardless of the order in the string.

Examples: `hdwshimlist='z1'`
`hdwshimlist='z1z2x1y1'`

See also: *NMR Spectroscopy User Guide*

Related:
- `create` Create new parameter in a parameter tree (C)
- `hdwshim` Hardware shimming (P)

het2dj — Set up parameters for HET2DJ pulse sequence (M)

Description: Sets up a HET2DJ (heteronuclear 2D-J) experiment.

See also: *NMR Spectroscopy User Guide*

Related:
- `foldj` Fold J-resolved 2D spectrum about *f1=0* axis (C)

HETCOR — Change parameters for HETCOR experiment (M)

Description: Converts the current parameter set to a HETCOR experiment. This is a phase-sensitive, multiplicity-selected experiment.

hetcor — Set up parameters for HETCOR pulse sequence (M)

Syntax: `hetcor<(exp_number)>`

Description: Sets up a HETCOR (heteronuclear chemical shift correlation) experiment.

Arguments: `exp_number` is the number of the experiment, from 1 to 9, in which a proton spectrum of the sample already exists.

See also: *NMR Spectroscopy User Guide*

Related:
- `plhxcor` Plot X,H-correlation 2D spectrum (M)
- `ppcal` Proton decoupler pulse calibration (M)

hetcorcp1 — Set up parameters for solids HETCOR pulse sequence (M)

Applicability: Systems with the solids module.

Description: Sets up a parameter set, obtained withXPOLAR1, for HETCORCP1, the solid-state heteronuclear correlation experiment.

See also: *User Guide: Solid-State NMR*

Related:
- `xpolar1` Set up parameters for XPOLAR1 pulse sequence (M)

hetcorps — Set up parameters for HETCORPS pulse sequence (M)

Description: Sets up parameters for a heteronuclear chemical shift correlation experiment (absolute value and phase sensitive).

See also: *NMR Spectroscopy User Guide*

hetero2d — Execute protocol actions of apptype hetero2d (M)

Applicability: Liquids

Description: Perform the actions for Homonuclear 2D protocols to set up, process, and plot experiments.

Examples:
`hetero2d('setup')` execute hetero2d experimental setup
`hetero2d('process')` execute hetero2d processing
`hetero2d('plot')` execute hetero2d plotting

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:
- `apptype` — Application type (P)
- `execpars` — Set up the exec parameters (M)

`hidecommand` Execute macro instead of command with same name (C)

Syntax: (1) `hidecommand(command_name)<:$new_name>`
(2) `hidecommand('?')`

Description: Renames (or hides) a built-in VnmrJ command so that a macro with the same name as the built-in command is executed instead of the built-in command.

Arguments: `command_name` is the name of the command to be renamed. To reset the built-in command back to its original name, enter `hidecommand` with the hidden name as the argument.

`$new_name` returns the new name of the built-in command. By using this new name, access is still available to the built-in command.

`'?'` is a keyword to display a list of all of the renamed built-in commands and their original names.

Examples:
```
hidecommand('sys'):$newname
hidecommand('Sys')
hidecommand('?')
```

See also: *System Administration; User Programming*

Related:
- `which` — Display which macro or command is used (M)

`hipwrampenable` High Power Amplifier Enable (P)

Applicability: VNMRS solids and systems with high power amplifiers.

Description: This parameter controls the High/Low Power Relay. If the parameter does not exist low power is used. If the parameter exists and the field corresponding to the physical channel is `'n'` then low power is used. If the parameter exists and the field corresponding to the physical channel is `'y'` then high power is used. The parameter is created in the current tree as a flag with `create('hipwrampenable','flag')`.

Values:
```
'y' Enable high power
'n' Enable low power and disable high power
```

Examples:
```
hipwrampenable='yny'
```

Physical channel 1 and 3 are high power enabled. Physical channel 2 is low power.

`Hmbc` Convert the parameter to a HMBC experiment (M)

Description: Convert the parameter to a HMBC experiment.

See also: *NMR Spectroscopy User Guide*

`Hmqc` Convert the parameter to a HMQC experiment (M)

Description: Convert the parameter to a HMQC experiment.

`HMQC15` Set up parameters for ^{15}N HMQC experiment (M)

Description: Converts the current parameter set to a HMQC experiment for ^{15}N.

H

HMQC_d2 **Set up parameters for ^{15}N HMQC experiment using dec. 2 (M)**

Description: Converts the current parameter set to a HMQC experiment for ^{15}N with decoupler 2 as ^{15}N.

HMQC_d213 **Set up parameters for ^{13}C HMQC experiment using dec. 2 (M)**

Description: Converts the current parameter set to a HMQC experiment for ^{13}C with decoupler 2 as ^{13}C.

hmqcr **Set up parameters for HMQCR pulse sequence (M)**

Applicability: Not needed in current systems. Normally was used in systems with a ^{1}H only decoupler.

Description: Sets up a HMQC (heteronuclear multiple-quantum coherence) experiment with "reverse" configuration.

See also: *NMR Spectroscopy User Guide*

Hmqctoxy **Convert the parameter to a HMQCTOXY experiment (M)**

Description: Convert the parameter to a HMQCTOXY experiment.

HMQCTOXY15 **Set up parameters for ^{15}N HMQCTOXY experiment (M)**

Description: Converts the current parameter set to a HMQCTOXY experiment for ^{15}N.

HMQCTOXY_d2 **Set up parameters for ^{15}N HMQCTOXY using decoupler 2 (M)**

Description: Converts the current parameter set to a HMQCTOXY experiment for ^{15}N with decoupler 2 as ^{15}N.

HMQCTOXY_d213 **Set up parameters for ^{13}C HMQCTOXY using decoupler 2 (M)**

Description: Converts the current parameter set to a HMQCTOXY experiment for ^{13}C with decoupler 2 as ^{13}C.

hmqctoxy3d **Set up parameters for HMQC-TOCSY 3D pulse sequence (M)**

Description: Sets up parameters for a HMQC-TOCSY 3D experiment with a presaturation option.

ho **Horizontal offset (P)**

Description: Horizontal offset of the each spectrum in a "stacked display" with respect to the previous spectrum,. For 1D data sets, the parameter vo sets the vertical offset. For 2D data sets, the parameter wc2 sets the vertical distance (in mm) between the first and last traces.

Values: Number, in mm, for offset size. For a "left-to-right" presentation, ho is typically negative; for "bottom-to-top" presentation, vo or wc2 is positive.

hom2dj **Set up parameters for HOM2DJ pulse sequence (M)**

Description: Sets up a HOM2DJ (homonuclear J-resolved 2D) experiment.

See also: *NMR Spectroscopy User Guide*

homo — Homodecoupling control for the observe channel (P)

Applicability: VNMRS liquids systems

Description: Homonuclear decoupling irradiates a single frequency if `hdseq = ''` (or if `hdseq` does not exist) or a frequency band if `hdseq ='filename'`. Pulse sequences do not require explicit homonuclear gating commands (`homo` function is similar to dm). A single RF channel, the observe channel, is used. The `homo='y'` setting cannot be used with pulse sequences containing explicit acquire commands.

Syntax: `homo=<'y' or 'n'>`

Values: `'y'` homonuclear decoupling rf and receiver gating is turned on during the acquisition time. Provides single frequency or band selective (`hdseq = 'filename'`) decoupling.

`'n'` homonuclear decoupling rf and receiver gating is turned off.

Related:

hdof	Frequency offset for homodecoupling (P)
hdpwr	Power level for homodecoupling (P)
hdpwrf	Homodecoupling fine power (P)
dutyc	Duty cycle for homodecoupling (optional) (P)
tn	Nucleus for observe transmitter (P)
homorof1	Delay before turning on homo decoupling rf (P)
homorof2	Delay after blanking the amplifier and setting T/R switch to receive (P)
homorof3	Delay between setting T/R switch to receive gating on the receiver (P)

HOMODEC — Change parameters for HOMODEC experiment (M)

Description: Converts the current parameter set to a HOMODEC experiment. A 1D proton spectrum is displayed to do peak selection.

homo2d — Execute protocol actions of apptype homo2d (M)

Applicability: Liquids

Description: Perform the actions for Heteronuclear 2D protocols to set up, process, and plot experiments.

Examples:
`homo2d('setup')` execute homo2d experimental setup
`homo2d('process')` execute homo2d processing
`homo2d('plot')` execute homo2d plotting

See also: *NMR Spectroscopy User Guide*, *VnmrJ Walkup*

Related:

apptype	Application type (P)
execpars	Set up the exec parameters (M)

homorof1 — Delay before turning on homo decoupling rf (P)

Applicability: VNMRS liquids systems

Description: Optional parameter for delay before turning on homonuclear decoupling after gating the receiver off. The amplifier is un-blanked and T/R switch set to transmit mode during homorof1 delay (in µsec. units). A default delay of 2 µsec. is used if the parameter does not exist.

Values: 2 to 5 µsec. are typical.

Related:	dutyc	The rf duty cycle fraction for homonuclear decoupling (P)
	hdmf	Modulation frequency for the band selective homonuclear decoupling (P)
	hdof	Frequency offset for homodecoupling (P)
	hdpwr	Sets the rf attenuator to control the power for homonuclear decoupling (P)
	hdpwrf	Sets the rf linear modulator fine power for homonuclear decoupling (P)
	hdseq	Sets the decoupler waveform filename (P)
	hdres	Sets the tip angle resolution (P)
	homo	Homodecoupling control for observe channel (P)
	homorof2	Delay after blanking the amplifier and setting T/R switch to receive (P)
	homorof3	Delay between setting T/R switch to receive gating on the receiver (P)
	tn	Nucleus for observe transmitter (P)

homorof2 Delay after blanking the amp and setting T/R switch to recv (P)

Applicability: VNMRS liquids systems

Description: Optional parameter for delay after the transmitter is gated off, the amplifier is blanked, and before the T/R switch is set to receive. A default delay of 2 µsec. is used if the parameter does not exist.

Values: 2 to 5 µsec. are typical.

Related:	dutyc	The rf duty cycle fraction for homonuclear decoupling (P)
	hdmf	Modulation frequency for the band selective homonuclear decoupling (P)
	hdof	Frequency offset for homodecoupling (P)
	hdpwr	Sets the rf attenuator to control the power for homonuclear decoupling (P)
	hdpwrf	Sets the rf linear modulator fine power for homonuclear decoupling (P)
	hdseq	Sets the decoupler waveform filename (P)
	hdres	Sets the tip angle resolution (P)
	homo	Homodecoupling control for observe channel (P)
	homorof1	Delay before turning on homo decoupling rf (P)
	homorof3	Delay between setting T/R switch to receive gating on the receiver (P)
	tn	Nucleus for observe transmitter (P)

homorof3 Delay between setting T/R to receive and gating the recvr on (P)

Applicability: VNMRS liquids systems

Description: Optional parameter for delay after the T/R switch is set to receive and before the receiver gate is gated on. A default delay of 2 µsec. is used if the parameter does not exist.

Values: 2 to 5 µsec. are typical

Related:	dutyc	The rf duty cycle fraction for homonuclear decoupling (P)
	hdmf	Modulation frequency for the band selective homonuclear decoupling (P)
	hdof	Frequency offset for homodecoupling (P)
	hdpwr	Sets the rf attenuator to control the power for homonuclear decoupling (P)
	hdpwrf	Sets the rf linear modulator fine power for homonuclear decoupling (P)
	hdseq	Sets the decoupler waveform filename (P)
	hdres	Sets the tip angle resolution (P)
	homo	Homodecoupling control for observe channel (P)
	homorof1	Delay before turning on homo decoupling rf (P)
	homorof2	Delay after blanking the amplifier and setting T/R switch to receive (P)
	tn	Nucleus for observe transmitter (P)

hoult **Set parameters alfa and rof2 according to Hoult (M)**

Description: Sets the values of alfa and rof2 according to a prescription advanced by D. I. Hoult (*J. Magn. Reson.* **51**, 110 (1983)). These parameters set the times that follow the final pulse, which can be important where the flatness of the baseline is of concern.

See also: *NMR Spectroscopy User Guide*

Related:

alfa	Set alfa delay before acquisition (P)
calfa	Recalculate alfa so that first-order phase is zero (M)
rof2	Receiver gating time following pulse (P)

hpa **Plot parameters on special preprinted chart paper (C)**

Description: Plots a predetermined list of parameters by "filling in the blanks" at the bottom of the preprinted chart paper available for Hewlett-Packard 7475- and 7550-series plotters.

See also: *NMR Spectroscopy User Guide*

Related:

apa	Plot parameters automatically (M)
x0	X-zero position of HP plotter or Postscript device (P)
y0	Y-zero position of HP plotter or Postscript device (P)

Hprescan **Proton prescan (P))**

Applicability: *VnmrJ Walkup*

Description: This parameter is used to keep track of the type and status of the Proton prescan. It is used for Proton, Presat, Wet1d, and Minsw protocols.

See also: *VnmrJ Walkup*

Related:

xmHprescan	Set up and process Proton prescans (M)

hregions **Select integral regions in proton spectrum (M)**

Description: Selects integral regions, a critical step in automatic processing of proton spectra. It is critical not only because of aesthetic reasons (some people like many small integrals, others prefer a few large regions), but also because other commands, such as bc, depend on the correct integration: bc can either fail or it can make broad, unintegrated lines disappear from the spectrum. hregions was specifically designed for proton spectra and should not be used for other types of spectra. The result of hregions also depends on the lineshape and the signal-to-noise ratio of a spectrum

See also: *NMR Spectroscopy User Guide*

Related:

bc	1D and 2D baseline correction (C)
integrate	Automatically integrate 1D spectrum (M)

hs **Homospoil pulses (P)**

Description: Turns on homospoil pulses at various times in different pulse sequences. Homospoil is a process by which the homogeneity is temporarily made very bad ("spoiled") to cause any transverse magnetizations present at that time to decay rapidly to zero. hst controls the length of any homospoil pulse.

Values: In a standard two-pulse sequence, homospoil pulses can be inserted during periods A and B (delays d1 and d2): hs='yn' gives a homospoil pulse at the beginning of d1, hs='ny' gives a pulse during d2, and hs='yy' gives

homospoil pulses during both d1 and d2. The desired value is generally hs='nn'.

See also: *NMR Spectroscopy User Guide*

Related:		
	d1	First delay (P)
	d2	Incremented delay in 1st indirectly detected dimension (P)
	hst	Homospoil time (P)

Hsqc — Convert the parameter to a HSQC experiment (M)

Description: Convert the parameter to a HSQC experiment.

HSQC15 — Set up parameters for ^{15}N HSQC experiment (M)

Description: Converts the current parameter set to a HSQC experiment for ^{15}N.

HSQC_d2 — Set up parameters for ^{15}N HSQC experiment using dec. 2 (M)

Description: Converts the current parameter set to a HSQC experiment for ^{15}N with decoupler 2 as ^{15}N.

HSQC_d213 — Set up parameters for ^{13}C HSQC experiment using dec. 2 (M)

Description: Converts the current parameter set to a HSQC experiment for ^{13}C with decoupler 2 as ^{13}C.

hsqcHT — Set up the hsqcHT experiment (M)

Description: Sets up parameters for a Hadamard-encoded hsqc experiment.

See also: *NMR Spectroscopy User Guide*

Related:		
	htofs1	Hadamard frequency list in ni (P)
	htfrq1	Hadamard offset in ni (P)
	fn1	Fourier number in 1st indirectly detected dimension (P)
	ni	Number of increments in 1st indirectly detected dimension (P)
	ft2d	Fourier transform 2D data (C)
	sethtfrq1	Set a Hadamard frequency list from a line list (M)
	Hsqc	Set up parameters for HSQC experiment (M)

Hsqctoxy — Convert parameters to a HSQCTOXY experiment (M)

Description: Convert the parameter to a HSQCTOXY experiment.

HSQCTOXY15 — Set up parameters for ^{15}N HSQCTOXY experiment (M)

Description: Converts the current parameter set to a HSQCTOXY experiment for ^{15}N.

HSQCTOXY_d2 — Set up parameters for ^{15}N HSQCTOXY using decoupler 2 (M)

Description: Converts the current parameter set to a HSQCTOXY experiment for ^{15}N with decoupler 2 as ^{15}N.

HSQCTOXY_d213 — Set up parameters for ^{13}C HSQCTOXY using decoupler 2 (M)

Description: Converts the current parameter set to a HSQCTOXY experiment for ^{13}C with decoupler 2 as ^{13}C.

hsqctoxySE **Set up parameters for HSQC-TOCSY 3D pulse sequence (M)**

Description: Sets up parameters for a HSQC -TOCSY 3D experiment.

hsrotor **Display rotor speed for solids operation (P)**

Applicability: Systems equipped with the rotor synchronization module.

Description: Controls display of rotor speed. Depending on whether the rotor synchronization module is present (set by the Rotor Synchronization label in the Spectrometer Configuration window, parameter `rotorsync` is set to 1 or 0. The `xpolar1` macro in turn uses this to create `hsrotor`, which is set to `'y'` if rotor synchronization is present. If the parameter `srate` exists, it is updated to the spin speed of the rotor at the end of the experiment. The interlock function specified by parameter `in` also changes. If `hsrotor='y'` and `in='y'`, the experiment is terminated if rotor speed deviates more than 100 Hz.

hst **Homospoil time (P)**

Description: Controls pulse length if homospoil is activated by the `hs` parameter.

Values: 0 to 20 ms (limited by hardware).

Values: `'n'` makes `srate` unmodified by acquisition and turns off the rotor speed display in `Acqstat`.

`'y'` makes the hardware information from the rotor synchronization board update `srate` and displays the rotor speed in the `Acqstat` status display.

See also: *User Guide: Solid-State NMR*

Related:

`Acqstat`	Bring up the acquisition status display (U)
`config`	Display current configuration and possibly change it (M)
`in`	Interlock (P)
`rotorsync`	Rotor synchronization (P)
`srate`	Spinning speed (P)
`xpolar1`	Set up parameters for XPOLAR1 pulse sequence (M)

htbitrev **Hadamard bit reversal flag (P)**

Description: A flag to enable or disable bit reversal of the Hadamard matrix. The flag should be the same for both acquisition and processing for the Hadamard transform to be successful.

Values: 'y' enable Hadamard bit reversal
'n' disable Hadamard bit reversal
Default value is 'n'.

See also: *NMR Spectroscopy User Guide*

Related:

`htfrq1`	Hadamard frequency list in `ni` (P)

htbw1 **Hadamard pulse excitation bandwidth in ni (P)**

Description: The excitation bandwidth used to generate the frequencies contained in the shaped pulses used by the Hadamard matrix. If a single value is specified, the same bandwidth is used for all frequencies. If the parameter is arrayed, the bandwidth array element is used by the corresponding array element in htfrq1.

Values: Default value is 20.0 if the parameter does not exist.

See also: *NMR Spectroscopy User Guide*

Related:
- `htfrq1` Hadamard frequency list in `ni` (P)
- `ni` Number of increments in 1st indirectly detected dimension (P)

`htcal1` RF calibration flag for Hadamard waveforms in ni (P)

Description: A flag to allow power optimization of Hadamard waveforms in the 1st indirect dimension.

Values: 0 power optimization using htpwr1 is disallowed
>0 power optimization using htpwr1 is allowed
Default value is 0.

See also: *NMR Spectroscopy User Guide*

Related:
- `htfrq1` Hadamard frequency list in `ni` (P)
- `htpwr1` Power level for rf calibration of Hadamard waveforms in ni (P)
- `ni` Number of increments in 1st indirectly detected dimension (P)

`htfrq1` Hadamard frequency list in ni (P)

Description: A list of frequencies used in Hadamard spectroscopy, used for creating the Hadamard pulse shapes, and for placing the transformed traces at the correct frequencies in the indirect dimension.

Values: Typical values are an arrayed set of frequencies between -`sw1`/2 and `sw1`/2.

See also: *NMR Spectroscopy User Guide*

Related:
- `htofs1` Hadamard offset in `ni` (P)
- `fn1` Fourier number in 1st indirectly detected dimension (P)
- `ni` Number of increments in 1st indirectly detected dimension (P)
- `sethtfrq1` Set Hadamard frequency list from a line list (M)
- `proc1` Type of processing on ni interferogram (P)
- `sw1` Spectral width in 1st indirectly detected dimension (P)

`htofs1` Hadamard offset in ni (P)

Description: The number of array elements to skip in ni when doing the Hadamard transform. The first element of the Hadamard matrix typically has all positive values (++++), and is usually not useful in constructing the Hadamard data.

Values: Default value is 0. Typical values are 1 or 2.

See also: *NMR Spectroscopy User Guide*

Related:
- `htfrq1` Hadamard frequency list in `ni` (P)
- `fn1` Fourier number in 1st indirectly detected dimension (P)
- `ni` Number of increments in 1st indirectly detected dimension (P)
- `ft2d` Fourier transform 2D data (C)
- `proc1` Type of processing on ni interferogram (P)

`htpwr1` Power level for RF calibration of Hadamard waveforms in ni (P)

Description: Power level for optimizing Hadamard waveforms in the 1st indirect dimension.

Values: -16 to 63 dB in steps of 1 dB.

See also: *NMR Spectroscopy User Guide*

Related:
- `htfrq1` Hadamard frequency list in `ni` (P)
- `htcal1` RF calibration flag for Hadamard waveforms in ni (P)
- `ni` Number of increments in 1st indirectly detected dimension (P)

htss1 — Stepsize for Hadamard waveforms in ni (P)

Description: Sets the stepsize during Hadamard waveform creation. Typically, this parameter is not needed, and a default stepsize is used.

Values: Does not exist - default stepsize is used.
0 default stepsize is used.
>0 stepsize in microseconds.

See also: *NMR Spectroscopy User Guide*

Related:

htfrq1	Hadamard frequency list in ni (P)
ni	Number of increments in 1st indirectly detected dimension (P)

hzmm — Scaling factor for plots (P)

Description: Contains the quotient of wp divided by wc, a scaling factor useful for plotting. hzmm applies to 1D only.

See also: *NMR Spectroscopy User Guide*

Related:

wc	Width of chart (P)
wp	Width of plot (P)

hztomm — Convert locations from Hz or ppm to plotter units (C)

Syntax:
(1) `hztomm(x_position)<:xmm>`
(2) `hztomm(x_position,y_position)<:xmm,ymm>`
(3) `hztomm(<'box',><'plotter'|'graphics',>x_left, x_right,y_bottom,y_top)<:x1mm,x2mm,y1mm,y2mm>`

Description: Converts locations from Hz, or ppm, to plotter units.

Arguments: `x_position` in syntax 1 is a location along the 1D axis, in Hz or ppm, to be converted to plotter units using the current values of parameters sp and wp. Plotter units are mm on most plots and are scaled for graphics display. For ppm entries, use the `p` suffix following numerical values (see first example below).

`x_position,y_position` in syntax 2 is a coordinate, in Hz or ppm, on a 2D plot to be converted to plotter units, using the parameters sp and wp to convert the horizontal position and the parameters sp1 and wp1 to convert the vertical position.

`x_left,x_right,y_bottom,y_top` in syntax 3 are box edges, in Hz or ppm, on a 2D plot to be converted to plotter units, using the parameters sp and wp to convert the left and right edges, and parameters sp1 and wp1 to convert the top and bottom edges.

`'box'` is a keyword to draw a box and to make the first two return arguments, if supplied, give the location of the upper left corner of the box, in plotter units.

`'plotter'` is a keyword to select the plotter. The default is `'graphics'`.

`'graphics'` is a keyword to select the graphics screen. This is the default.

`x1mm,x2mm,y1mm,y2mm` are return arguments giving values in plotter units. If return arguments are not supplied, the results are displayed instead.

Examples:

```
hztomm(20p)
hztomm(xpos,ypos):xmm,ymm
hztomm('box','plotter',20,50,10,30)
```

See also: *NMR Spectroscopy User Guide*

Related:

box	Draw a box on a plotter or graphics display (C)
sp	Start of plot in directly detected dimension (P)
sp1	Start of plot in 1st indirectly detected dimension (P)

wp	Width of plot in directly detected dimension (P)
wp1	Width of plot in 1st indirectly detected dimension (P)

I

i	Insert sample (M)
ihwinfo	Hardware status of console (U)
il	Interleave arrayed and 2D experiments (P)
ilfid	Interleave FIDs during data processing (C)
imagefile	Display an image file (M)
imageprint	Plot non interactive gray scale image (M)
imconi	Display 2D data in interactive grayscale mode (M)
in	Lock and spin interlock (P)
inadqt	Set up parameters for INADEQUATE pulse sequence (M)
index2	Projection or 3D plane index selected (P)
inept	Set up parameters for INEPT pulse sequence (M)
initialize_iterate	Set iterate string to contain relevant parameters (M)
input	Receive input from keyboard (C)
ins	Integral normalization scale (P)
ins2	2D volume value (P)
insref	Fourier number scaled value of an integral (P)
ins2ref	Fourier number scaled volume of a peak (P)
insert	Insert sample (M)
inset	Display an inset spectrum (C)
integ	Find largest integral in a specified region (C)
integrate	Automatically integrate 1D spectrum (M)
intmod	Integral display mode (P)
intvast	Produces a text file of integral regions (M)
io	Integral offset (P)
is	Integral scale (P)
isadj	Automatic integral scale adjustment (M)
isadj2	Automatic integral scale adjustment by powers of two (M)
isreal	Utility macro to determine a parameter type (M)
isstring	Utility macro to determine a parameter type (M)
iterate	Parameters to be iterated (P)

i — Insert sample (M)

Description: Turns off the eject air, waits for sample to slowly drop, and then turns off the slow drop air. The macro `insert` functions the same as `i`.

See also: *NMR Spectroscopy User Guide*

Related:

e	Eject sample (M)
eject	Eject sample (M)
insert	Insert sample (M)

ihwinfo — Hardware status of console (U)

Syntax: (From UNIX) `ihwinfo('startup'|'abort')`

Description: Displays status of digital hardware in the console. The output is intended for service personnel and probably not meaningful to users.

Arguments: `'startup'` is a keyword to display the status at the conclusion of the last console startup (powerup, reboot, etc.).

`'abort'` is a keyword to display the status the last time an acquisition was aborted or the console rebooted from the host computer (`abortallacqs`). In this context, exiting from either the FID display or lock display of `acqi` counts as an abort. Only the status from the last abort can be displayed.

Examples:
```
ihwinfo('startup')
ihwinfo('abort')
```

See also: *NMR Spectroscopy User Guide*

Related:

`abortallacqs`	Reset acquisition computer in a drastic situation (C)
`showconsole`	Show console configuration parameters (U)

il — Interleave arrayed and 2D experiments (P)

Applicability: Interleaving is not currently supported for the VNMRS or MR400 system.

ilfid — Interleave FIDs during data processing (C)

Description: Converts a multiple FID element into a single FID. It is possible to effectively extend the Nyquist frequency (i.e., increase the effective spectral width `sw`) by acquiring a number of FIDs with different *tau2* values and then reprocessing the data. `ilfid` does the necessary processing of time-domain data to achieve this extension, assuming that a pulse sequence (not supplied) has been written to generate the required data.

When invoked in an experiment of `nf` FIDs, each of `np` points, `ilfid` sorts the data into a single FID of `np*nf` points that can then be transformed. The interleaving takes the first complex point of each of the `nf` FIDs and places them in sequential order in the new FID. It then takes the second complex point from each of the `nf` FIDs and appends them sequentially to the new FID. This operation is repeated for all complex points. Although `ilfid` adjusts `np` and `nf`, it does not alter other parameters such as `sw`.

CAUTION: **Because `ilfid` alters the data irrevocably, it is strongly recommended that you save the FID before using `ilfid`.**

Examples: Illustrated below is the interleaving of an FID with `nf=3` and `np=4`. Each point is represented by two digits. The first digit is the `nf` number and the second digit is the sequential point for that `nf` value. Data before the `ilfid` command:

```
11, 12, 13, 14; 21, 22, 23, 24; 31, 32, 33, 34
```

Data after the `ilfid` command:

```
11, 21, 31, 12, 22, 32, 13, 23, 33, 14, 24, 34
```

See also: *NMR Spectroscopy User Guide*

Related:

`nf`	Number of FIDs (P)
`np`	Number of data points (P)
`sw`	Spectral width in directly detected dimension (P)

imagefile — Display an image file (M)

Applicability: Imaging

Syntax: `imagefile('output_option','imagefile'<,x,y,w,h,'mol'>)`

Description: Display or plot an imagefile at default location and size or, optionally, at location and size specified by: `x` (x-position), `y` (y-position), `w` (width), `h`

(height), and mol if it is an image file of a molecular structure. Display all, plot all, or clear all images for the current experiment.

Arguments: output_option choices are:

clear, clear all images for the current experiment
display, display imagefile
displayall, displays all images for the current experiment
plot, plot imagefile
plotall, plot all images for the current experiment

imagefile, name of image file to display or plot

x, x position

y, y position

w, width

h, height

mol molecular structure image file

Examples: imagefile('clear') clear all images for the current experiment.

imagefile('displayall') display all images for the current experiment.

imageprint Plot non interactive gray scale image (M)

Description: Sends to the plotter a dcon color intensity map with linear instead of logarithmic increments and with grayscale instead of colors.

See also: *NMR Spectroscopy User Guide*

Related: dcon Display noninteractive color intensity map (C)

imconi Display 2D data in interactive grayscale mode (M)

Description: Calls the dconi program with the arguments required for grayscale image display: dconi('dcon','gray','linear').

in Lock and spin interlock (P)

Description: Controls error handling based on lock level and spin speed, and specifies action based on lock level failure or spinner failure. The action can be to generate an error and halt acquisition, or to generate a warning and continue acquisition.

Values: Can be set to one or two characters:

- If set to two characters, the first character specifies the action for lock failure and the second character specifies the action for spinner failure.
- If set to only one character, that character specifies the same action for either lock or spinner failure.

'n' stops any system checking so that acquisition continues regardless of the lock level or spin speed.

'w' makes the system check the lock level and the spin speed. A warning message is added to the log file if the lock level falls below a preset hardware level (about 20 on the lock meter) or if spin is set to a particular value and the spin speed goes out of regulation; however, acquisition is not stopped.

'y' makes the system check the lock level and spin speed. Acquisition is halted if the lock level falls below a preset hardware level (about 20 on the lock meter) or if spin is set to a particular value and the spin speed goes out of regulation.

See also: *NMR Spectroscopy User Guide*

Related: `spin` Sample spin rate (P)

`inadqt` Set up parameters for INADEQUATE pulse sequence (M)

Description: Sets up parameters for 2D INADEQUATE (Incredible Natural Abundance Double-Quantum Transfer Experiment).

See also: *NMR Spectroscopy User Guide*

Related: `foldcc` Fold INADEQUATE data about 2-quantum axis (C)

`index2` Projection or 3D plane index selected (P)

Description: Stores whether a projection or 3D plane index is selected. It shows the current status only and cannot be used to select a plane or projection. This parameter is also displayed in the Status window below "Index."

Values: 0 indicates a projection is selected.

1 to the half the Fourier number of the normal axis indicates a 3D plane is selected; the number is the index of the 3D plane.

See also: *NMR Spectroscopy User Guide*

Related:
- `dplane` Display a 3D plane (M)
- `dproj` Display a 3D plane projection (M)
- `nextpl` Display the next 3D plane (M)
- `prevpl` Display the previous 3D plane (M)
- `select` Select a spectrum or 2D plane without displaying it (C)

`inept` Set up parameters for INEPT pulse sequence (M)

Description: Sets up parameters for the INEPT (Insensitive Nuclei Enhanced by Polarization Transfer) experiment.

See also: *NMR Spectroscopy User Guide*

Related: `ppcal` Proton decoupler pulse calibration (M)

`initialize_iterate` Set iterate string to contain relevant parameters (M)

Description: Takes the current spin system (contained in `spinsys`) and derives from it relevant parameters. This can be used to control which parameters are iterated during a spin simulation iteration (e.g., for an ABC spin system, `iterate` is set to `'A,JAB,JAC,B,JBC,C'`).

See also: *NMR Spectroscopy User Guide*

Related: `iterate` Parameters to be iterated (P)

`input` Receive input from keyboard (C)

Syntax: `input<(<prompt><,delimiter>)>:var1,var2,...`

Description: Receives fields of characters from the keyboard and stores them into one or more variables.

Arguments: `prompt` is a string displayed on the command line.

`delimiter` is a character separating input fields. The default is a comma.

`var1,var2,...` are return values. `input` stores the values into as many of these arguments as given and ignores the rest of the input line.

Examples:
```
input:$b
input('Enter pulse width:'):pw
input('x and y coordinates'):cr,cr1
input('Enter lastname:firstname',':'):$last,$first
```

See also: *User Programming*

Related:

string	Create a string variable (C)

ins — Integral normalization scale (P)

Description: Sets the integral value, independent of is and vs. Reported integral values are scaled by fn; that is, the reported integral of a given region is independent of fn. The insref parameter is also used to determine a reference integral value. The setint macro sets integral value.

See also: *NMR Spectroscopy User Guide*

Related:

dlni	Display list of normalized integrals (M)
fn	Fourier number in directly detected dimension (P)
is	Integral scale (P)
insref	Fourier number scaled value of an integral (P)
mark	Determine intensity of spectrum at a point (C)
setint	Set value of an integral (M)
vs	Vertical scale (P)

ins2 — 2D volume value (P)

Description: Adjusts the 2D volume value, independent of is and vs. The volume is scaled by Fourier numbers for the two dimensions.

See also: *NMR Spectroscopy User Guide*

Related:

is	Integral scale (P
ins2ref	Fourier number scaled volume of a peak (P)
ll2d	Automatic and interactive 2D peak peaking (C)
vs	Vertical scale (P)

insref — Fourier number scaled value of an integral (P)

Description: Set to the Fourier number scaled value of a selected integral. The reported integral values will be *(integral value)**ins/insref/fn. If insref is “not used”, the sum of all integrals will be ins. The “not used” mode is the equivalent of the normalized integral mode. If insref is zero or not defined, the reported integrals will be *(integral value)**ins/fn.

See also: *NMR Spectroscopy User Guide*

Related:

fn	Fourier number in directly detected dimension (P)
ins	Integral normalization scale (P)
liamp	Amplitudes of integral reset points (P)
setint	Set value of an integral (M)

ins2ref — Fourier number scaled volume of a peak (P)

Description: Set to the Fourier number scaled volume of the selected peak. The reported volume is *volume**ins2/ins2ref/fn/fn1. If ins2ref is “not used”, sum of all volumes is ins2. The “not used” mode is equivalent to a normalized volume mode. If ins2ref is zero or not defined, the reported volume is *volume**ins2/fn/fn1.

See also: *NMR Spectroscopy User Guide*

Related:

fn	Fourier number in directly detected dimension (P)
fn1	Fourier number in first indirectly detected dimension (P)
ins2	2D volume value (P)
ll2d	Automation and interactive 2D peak picking (C)

insert — Insert sample (M)

Description: Turns off the eject air, waits for the sample to slowly drop, and then turns off the slow drop air. The macro i is identical in function to insert.

See also: *NMR Spectroscopy User Guide*

Related:

e	Eject sample (M)
eject	Eject sample (M)
i	Insert sample (M)

inset — Display an inset spectrum (C)

Description: Displays the part of the spectrum between the two cursors as an inset. Before entering inset, run the ds command and display two cursors. The vertical position is shifted up about one-quarter of the height of the whole display canvas. The old spectrum remains on the screen, but the parameters shown at the bottom are relevant to the new display. If present, the integral trace is duplicated. The scale is also duplicated if it is present. After running inset, you can shift the displayed spectrum, expand it, or even contract it with the left and right mouse buttons.

See also: *NMR Spectroscopy User Guide*

Related:

ds	Display a spectrum FID (C)

integ — Find largest integral in a specified region (C)

Syntax: `integ<(highfield,lowfield)><:size,value>`

Description: Finds the largest absolute-value integral in the specified region, or the total integral if no reset points are present between the specified limits.

Arguments: highfield and lowfield are the limits of the region. The default values are the parameters sp and sp+wp, respectively.

size is a return value with the size of the largest integral. The size depends on the value of the parameter is and can be positive or negative.

value is a return argument with the value of the largest integral. This value depends on ins, insref, and fn, and is independent of is.

Examples:

```
integ:r1,r2
integ(500,1000):$height
integ(100+sp,300+sp):$ht,$val
```

See also: *User Programming*

Related:

fn	Fourier number in directly detected dimension (P)
ins	Integral normalization scale (P)
insref	Fourier number scaled value of an integral (P)
is	Integral scale (P)
rp	Zero-order phase in directly detected dimension (P)
sp	Start of plot in directly detected dimension (P)
wp	Width of plot in directly detected dimension (P)

integrate — Automatically integrate 1D spectrum (M)

Description: A universal macro for selecting integral regions and adjusting the integrals in size and offset. Only if regions are not already selected, and if `intmod` is set to `'partial'`, will `integrate` call `region` to select integral regions. For proton spectra, the selection is done through the `hregions` macro; for ^{19}F and ^{31}P spectra (for wide spectral windows, multiplet spectra), `region` is called with optimized arguments, and for other nuclei (mostly decoupled, single-line spectra) other optimized parameters are used with `region`, such that lines consisting of a few data points only are recognized.

See also: *NMR Spectroscopy User Guide*

Related:

`hregions`	Select integral regions in proton spectrum (M)
`intmod`	Integral display mode (P)
`isadj`	Adjust integral scale (M)
`region`	Automatically select integral regions (C)

intmod — Integral display mode (P)

Description: Controls display and plotting of the spectral integral.

Values: `'off'` indicates that no integrals are displayed or plotted.

`'full'` indicates that all integral regions are displayed or plotted.

`'partial'` indicates that every other integral region is plotted (typically used to display integrals of only peaks and not of the baseline region).

See also: *NMR Spectroscopy User Guide*

Related:

`plc`	Plot carbon spectrum (M)
`plh`	Plot proton spectrum (M)
`plp`	Plot phosphorus spectrum (M)

intvast — Produces a text file of integral regions (M)

Applicability: Systems with VAST accessory.

Syntax: `intvast (last)`

Description: `intvast` produces a text file, integ.out in the current experiment, containing the integrals of the partial regions of each spectra from wells 0 to `last`.

Arguments: `last` is the number last sample well. The default is 96.

See also: *NMR Spectroscopy User Guide*

Related:

`pintvast`	Plot the integrals (M)

io — Integral offset (P)

Description: Offset of the integral with respect to the spectrum.

Values: 0 to 200, in mm.

See also: *NMR Spectroscopy User Guide*

is — Integral scale (P)

Description: Multiplier that adjusts height of the displayed integral trace. Note that the `ins` parameter controls integral value, and that `is` has no effect on integral value.

Values: 1 to 1e9

See also: *NMR Spectroscopy User Guide*

Related:		
	ins	Integral normalization scale (P)
	ins2	2D volume value (P)
	insref	Fourier number scaled value of an integral (P)
	integ	Find largest integral in a specified region (C)

isadj — Automatic integral scale adjustment (M)

Syntax: `isadj<(height<,neg_height>)>`

Description: Adjusts the height of the integrals in a display to make the tallest integral fit the paper. Optionally, the height of the maximum integral can be specified by an argument. Negative integrals, if present, are given a limit of 10 mm if parameter `io` is less than 10; otherwise, they are set so they end 5 mm above the spectrum. Negative integrals can also be given a height. Whichever part of the integrals (positive or negative) runs into the given limit will be used to scale `is`.

Arguments: `height` is the size, in mm, of the maximum integral on display. The default is the height that makes the tallest integral fit the paper.

`neg_height` is the desired height, in mm, of the largest negative integral. If `io` is less than 10, the default is 10; otherwise, the default height is 5 mm above the spectrum.

Examples:
```
isadj
isadj(100)
isadj(100,100)
```

See also: *NMR Spectroscopy User Guide*

Related:		
	io	Integral offset (P)
	is	Integral scale (P)
	isadj2	Automatic integral scale adjustment by powers of two (M)

isadj2 — Automatic integral scale adjustment by powers of two (M)

Syntax: `isadj2<(height<,neg_height>)>:scaling_factor`

Description: Functionally the same as `isadj` except that `isadj2` adjusts the integral height by powers of two and returns the scaling factor to the calling macro.

Arguments: `height` is the size, in mm, of the maximum integral on display.

`neg_height` is the desired height, in mm, of the maximum negative integral on display.

`scaling_factor` is a return value giving the ratio of the new integral size to the old value (`new_is/old_is`).

Examples:
```
isadj2
isadj2(100)
isadj2(100,100)
isadj2(50):r1
```

See also: *NMR Spectroscopy User Guide*

Related:		
	is	Integral scale (P)
	isadj	Automatic integral scale adjustment (M)

isreal — Utility macro to determine a parameter type (M)

Syntax: `isreal(paramname<,tree>)`

Description: Returns 1 if and only if `paramname` is a real type. It returns 0 if paramname is a string type. If there is an error, the error is reported and the macro also returns

0. The value of tree is 'current', 'global', 'processed' or 'systemglobal' and the default is 'current'.

There is some unfortunate ambiguity and vagueness in regard to vnmr parameters and their types. The meaning of real and string vary slightly depending upon context. There are seven types altogether. The macro gettype returns a unique integer value when operating on the parameter. Of the seven types, two can be broadly categorized as string, and five can be broadly categorized as real. Since one of the string category types is 'string' and one of the real category types is 'real', this is where the ambiguity arises. The return values for gettype are:

category	*type*	*gettype returns*
string	'string'	2
	'flag'	4
real	'real'	1
	'delay'	3
	'frequency'	5
	'pulse'	6
	'integer'	7

The isreal function returns 0 for the string category and 1 for the real category. This function is consistent with the typeof() operator. The typeof() operator is primarily intended to ascertain the type of the input argument to a macro, so using it for other purposes is not recommended. Also, it does not take a tree argument. Note that typeof() returns 0 for reals and 1 for strings, the opposite of this macro, but it should be clear from the name what is intended. A sister macro isstring returns the same value as typeof().

Related:
- isstring — Utility macro to determine a parameter type (M)
- typeof — Return identifier for argument type (O)

isstring — Utility macro to determine a parameter type (M)

Syntax: isstring(paramname<,tree>)

Description: Returns 1 if and only if paramname is a string type. It returns 0 if paramname is a real type. If there is an error, the error is reported and the macro also returns 0. The value of tree is 'current', 'global', 'processed' or 'systemglobal' and the default is 'current'.

There is some unfortunate ambiguity and vagueness in regard to vnmr parameters and their types. The meaning of real and string vary slightly depending upon context. There are seven types altogether. The macro gettype returns a unique integer value when operating on the parameter. Of the seven types, two can be broadly categorized as string, and five can be broadly categorized as real. Since one of the string category types is 'string' and one of the real category types is 'real', this is where the ambiguity arises. The return values for gettype are:

category	*type*	*gettype returns*
string	'string'	2
	'flag'	4
real	'real'	1
	'delay'	3

category	*type*	*gettype returns*
	`'frequency'`	5
	`'pulse'`	6
	`'integer'`	7

The function `isstring` returns 0 for the real category and 1 for the string category. This function is consistent with the `typeof()` operator. The `typeof()` operator is primarily intended to ascertain the type of the input argument to a macro, so using it for other purposes is not recommended. Also, it does not take a tree argument. Note that `typeof()` returns 0 for reals and 1 for strings, the opposite of this macro, but it should be clear from the name what is intended. A sister macro `isstring` returns the same value as `typeof()`.

Related: `isreal` Utility macro to determine a parameter type (M)
`typeof` Return identifier for argument type (O)

`iterate` Parameters to be iterated (P)

Description: Contains parameters to be iterated during iterative spin simulations. If the Set Params button is used in setting up spin simulation parameters, `iterate` is initialized to a string containing all parameters appropriate to the current spin system.

Values: List of parameters, separated by commas (e.g., `iterate='A,B,JAB'`).

See also: *NMR Spectroscopy User Guide*

Related: `initialize_iterate` Set `iterate` string to contain relevant parameters (M)

J

jcurwin	Work space numbers of all viewports (P)
jdesign	Start Plot Designer Program (M)
jexp	Join existing experiment (C)
jexp1-jexp9999	Join existing experiment and display new parameters (M)
jplot	Plot from Plot Designer program (C)
jplotscale	Scale plot parameters (M)
jplotunscale	Restore current experiment parameters (M)
jprint	Prints the selected images to a printer or file (M)
jumpret	Set up parameters for JUMPRET pulse sequence (M)
jviewport	Work space numbers of the current viewports (P)
jviewportlabel	Work space labels for all viewport buttons (P)
jviewports	Viewport layout (P)
jwin	Activate and record activity in current window (M)

jcurwin — Work space numbers of all viewports (P)

Description: An arrayed global parameter, set to the work space numbers used by all viewports.

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:

curwin	Current window (P)
jviewport	Work space numbers of the current viewports (P)
jviewportlabel	Work space labels for all viewport buttons (P)

jdesign — Start Plot Designer Program (M)

Syntax: `jdesign`

Description: Opens the Plot Designer program, which provides mechanisms for positioning spectra, parameters, axes, and other plot output on a page. Text annotation and drawing features are available.

See also: *NMR Spectroscopy User Guide*

Related:

jplot	Plot from Plot Designer program (C)

jexp — Join existing experiment (C)

Syntax:
(1) `jexp(exp_number)`
(2) `jexp:$current_exp_number,$current_exp_name`

Description: Joins an existing experiment (syntax 1) or returns the current experiment number and experiment name (syntax 2). After entering this command, until another “join experiment” command or macro is entered, all actions (including changes of parameters, acquisition of data, and display of data) apply to the parameters and data of the experiment joined.

The `jexp` command does not refresh the display or display new experiment parameters. Use one of the macros `jexp1`, `jexp2`, etc. to join an experiment and have the screen refreshed and new parameters displayed.

Arguments: `exp_number` is a number from 1 to 9999 for existing experiment to be joined.

`$current_exp_number` is a return value with the current experiment number.

`$current_exp_name` is a return value with the current experiment name.

Examples:
```
jexp(3)
jexp:$expp
jexp:r1,n1
```

See also: *NMR Spectroscopy User Guide; VnmrJ Walkup*

Related:

`cexp`	Create an experiment (M)
`delexp`	Delete an experiment (M)
`jexp1-jexp9`	Join existing experiment and display new parameters (M)
`unlock`	Remove inactive lock and join experiment (C)

`jexp1-jexp9999` Join existing experiment and display new parameters (M)

Syntax: `jexp1, jexp2, jexp3, ...,jexp9999`

Description: Joins an existing experiment, refreshes the screen, and displays the main menu and the new experiment parameters. After entering this macro, until another "join experiment" command or macro is entered, all actions (including changes of parameters, acquisition of data, and display of data) apply to the parameters and data of the experiment joined.

To join an experiment without refreshing the screen and displaying new parameters, use the `jexp` command.

Examples:
```
jexp8
jexp354
```

See also: *NMR Spectroscopy User Guide*

Related:

`cexp`	Create an experiment (M)
`delexp`	Delete an experiment (M)
`jexp`	Join existing experiment (C)
`unlock`	Remove inactive lock and join experiment (C)

`jplot` Plot from Plot Designer program (C)

Syntax: `jplot<(<'-setup'><,template)>`

Description: Starts plotting from the Plot Designer program to the current plotter.

Arguments: `'-setup'` is a keyword to start `jdesign`, the Plot Designer program, to allow interactive design and plotting.

`template` is the name of a file that will be used to make a plot of the current experiment. The default is a saved file chosen by the user.

Examples:
```
jplot
jplot('t1')
```

See also: *NMR Spectroscopy User Guide*

Related:

`jdesign`	Start Plot Designer program (M)
`jplotscale`	Scale plot parameters (M)
`jplotunscale`	Restore current experiment parameters (M)

`jplotscale` Scale plot parameters (M)

Applicability: Plot Designer program

Description: Scales parameters of plotting area and an imported plot. When a region is drawn in Plot Designer, `jplotscale` automatically changes the plotting area parameters `wcmax` and `wc2max`. The parameters `io`, `is`, `vs`, `wc`, and `wc2` of a plot imported into a region are adjusted according to `wcmax` and `wc2max`.

See also: *NMR Spectroscopy User Guide*

Related:

`jplot`	Plot from Plot Designer program (C)
`jplotunscale`	Restore current experiment parameters (M)

`jplotunscale` Restore current experiment parameters (M)

Applicability: Plot Designer program

Description: Restores the current experiment parameters (`io`, `is`, `vs`, `wc`, and `wc2`) to a plot within a region that was created in Plot Designer. For example, entering `jplotunscale jexp2 jplotscale` restores the parameters of experiment 2 to a plot and then `jplotscale` applies the adjusted parameters to the plot.

See also: *NMR Spectroscopy User Guide*

Related:

`jplot`	Plot from Plot Designer program (C)
`jplotscale`	Scale plot parameters (M)

`jprint` Prints the selected images to a printer or file (M)

Description: The `jprint` macro takes the value of the parameters `printregion`, `printsend`, `printfile`, `printlayout`, `printformat`, `printsize`.

`jumpret` Set up parameters for JUMPRET pulse sequence (M)

Description: Sets up parameters for a jump-and-return water suppression sequence.

See also: *NMR Spectroscopy User Guide*

`jviewport` Work space numbers of the current viewports (P)

Description: A global parameter, set to the work space number that the current viewport is joined to. The parameter is set when the viewport starts. Each viewport may be joined to a different work space.

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:

`curwin`	Current window (P)
`jcurwin`	Work space numbers of all viewports (P)
`jviewports`	Viewport layout (P)
`jviewportlabel`	Work space labels for all viewport buttons (P)

`jviewportlabel` Work space labels for all viewport buttons (P)

Description: An arrayed global parameter, set to the labels on the toolbar buttons used to switch viewports. It is used by the viewport editor under **Edit -> Viewports**.

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:

`jviewport`	Work space numbers of the current viewports (P)
`jviewports`	Viewport layout (P)
`vpaction`	Set initial state for multiple viewports (M)

J

jviewports — Viewport layout (P)

Description: An arrayed global parameter, used to keep track of the viewport layout. It is used by the viewport editor under **Edit -> Viewports** to change the viewport layout.

Related:

jcurwin	Work space numbers of all viewports (P)
jviewport	Work space numbers of the current viewports (P)
jviewportlabel	Work space labels for all viewport buttons (P)
vpaction	Set initial state for multiple viewports (M)
vpset3def	Set the viewport state to three default viewports (M)
vpsetup	Set new viewports (M)

jwin — Activate and record activity in current window (M)

Syntax: `jwin(pane_number)`

Description: Activates and records the activity in a specific window pane, created by `setgrid`, in the VnmrJ graphics window. `jwin` is executed when you double-click the left mouse button in a multiple-paned graphics window.

Arguments: `pane_number` is the number of the pane to join.

Examples: `jwin(2)`

See also: *NMR Spectroscopy User Guide*

Related:

curwin	Current window (P)
fontselect	Open FontSelect window (C)
mapwin	List of experiment numbers (P)
setgrid	Activate selected window (M)
setwin	Activate selected window (C)

K

killft3d	Terminate any ft3d process started in an experiment (M,U)
killplot	Stop plot jobs and remove from plot queue (M)
killprint	Stop print jobs and remove from print queue (M)
kind	Kinetics analysis, decreasing intensity (M)
kinds	Kinetics analysis, decreasing intensity, short form (M)
kini	Kinetics analysis, increasing intensity (M)
kinis	Kinetics analysis, increasing intensity, short form (M)

killft3d — Terminate any ft3d process started in an experiment (M,U)

Syntax: `killft3d(exp_number)`

Description: Terminates any `ft3d` program that has been started in the specified VnmrJ experiment. `killft3d` can be executed from any experiment. For each `ft3d` process terminated, the relevant 3D data subdirectory is also deleted. Remote `ft3d` processes, denoted by the call name `ftr3d` in the process table (displayed by the UNIX command `ps -azx`), are not directly terminated by `killft3d` but die of their own accord due to the deletion of the 3D data subdirectory.

The `killft3d` command can also be run as a shellscript from UNIX. Its function is analogous to the associated VnmrJ macro.

Arguments: `exp_number` is a number from 1 to 9 that identifies the experiment that started the `ft3d` program.

Examples: `killft3d(4)`

See also: *NMR Spectroscopy User Guide*

Related: `ft3d` Perform a 3D Fourier transform (M,U)

killplot — Stop plot jobs and remove from plot queue (M)

Description: Kills all current plot jobs in the plot queue for the active plotter in VnmrJ, then removes the jobs from the plot queue. Unless the user executing `killplot` is `root`, only that user's plot jobs are deleted from the plot queue. To kill a plot that is in progress (i.e., a plot in which you have not entered `page`), use the `page('clear')` command.

The plotter may have to be reinitialized after `killplot` is executed. To reinitialize the plotter, turn it off and then back on after a few seconds. Hewlett-Packard (HP) pen plotters appear to be more susceptible to this problem than the other HP output devices supported by VnmrJ.

If one port is configured to be both a printer and a plotter, `killplot` can cause both plot *and* print jobs to that port to be deleted. For example, if `printer='LaserJet_300'`, `plotter='LaserJet_300R'`, and a plot command `pl pscale page` is followed by a print command `ptext(vnmruser+'/psglib/noesy.c')`, entering `killplot` deletes both jobs.

See also: *NMR Spectroscopy User Guide*

Related:

killprint	Stop print jobs and remove from print queue (M)
page	Move plotter forward one or more pages (C)
pl	Plot spectra (C)
pscale	Plot scale below spectrum or FID (C)
ptext	Print out a text file (M)
showplotq	Display plot jobs in plot queue (M)

killprint — Stop print jobs and remove from print queue (M)

Description: Kills all current print jobs in the print queue for the active printer in VnmrJ, then removes the jobs from the print queue. Unless the user executing killprint is root, only that user's print job is deleted from the print queue. It is slightly possible that the printer may have to be reinitialized after the execution of this macro. To reinitalize the printer, turn it off, wait a few seconds, and then turn it back on.

If one port is configured to be both a printer and a plotter, killprint can cause both print *and* plot jobs to that port to be deleted. For example, if printer='LaserJet_300', plotter='LaserJet_300R', and a plot command pl pscale page is followed by a print command ptext(vnmruser+'/psglib/noesy.c'), entering killprint deletes both jobs.

See also: *NMR Spectroscopy User Guide*

Related:

killplot	Stop plot jobs and remove from plot queue (M)
ptext	Print out a text file (M)
showprintq	Display print jobs in print queue (M)

kind — Kinetics analysis, decreasing intensity (M)

Description: If the signal decreases exponentially toward a limit, the output is matched by *I = A1 * EXP(–T/TAU) + A3*. This macro supplies the necessary keywords to the analyze command, which uses the output of fp (i.e., the file fp.out) as input. The results can be displayed with expl.

See also: *NMR Spectroscopy User Guide*

Related:

analyze	Generalized curve fitting (C)
expl	Display exponential/polynomial curves (C)
fp	Find peak heights (C)
kinds	Kinetic analysis, decreasing intensity, short form (M)
kini	Kinetics analysis, increasing intensity (M)
kinis	Kinetic analysis, increasing intensity, short form (M)

kinds — Kinetics analysis, decreasing intensity, short form (M)

Description: Produces a summary of the results from kind.

See also: *NMR Spectroscopy User Guide*

Related:

kind	Kinetics analysis, decreasing intensity (M)

kini — Kinetics analysis, increasing intensity (M)

Description: If the signal increases exponentially toward a limit, the output is matched by *I = –A1 * EXP(–T/TAU) + A3 – A1*. This macro supplies the necessary keywords to the analyze command, which uses the output of fp (i.e., the file fp.out) as input. The results can be displayed with expl.

See also: *NMR Spectroscopy User Guide*

Related:
- `kind` Kinetics analysis, decreasing intensity (M)
- `kinis` Kinetic analysis, increasing intensity, short form (M)

`kinis` Kinetics analysis, increasing intensity, short form (M)

Description: Produces a summary of the results from `kini`.

See also: *NMR Spectroscopy User Guide*

Related:
- `kind` Kinetics analysis, decreasing intensity (M)
- `kini` Kinetics analysis, increasing intensity (M)

K

L

lastlk	Last lock solvent used (P)
lastmenu	Menu to display when Return button is selected (P)
latch	Frequency synthesizer latching (P)
lb	Line broadening in directly detected dimension (P)
lb1	Line broadening in 1st indirectly detected dimension (P)
lb2	Line broadening in 2nd indirectly detected dimension (P)
lc1d	Pulse sequence for LC-NMR (M)
lcpar2d	Create 2D LC-NMR acquisition parameters (M)
lcpeak	Peak number (P)
lcplot	Plot LC-NMR data (M)
lcpsgset	Set up parameters for various LC-NMR pulse sequences (M)
lcset2d	General setup for 2D LC-NMR experiments (M)
left	Set display limits to left half of screen (C)
legrelay	Independent control of magnet leg relay (P)
length	Determine length of a string (C)
lf	List files in directory (C)
liamp	Amplitudes of integral reset points (P)
lifrq	Frequencies of integral reset points (P)
liqbear	Liquids Bearing Air Level (P)
listenoff	Disable receipt of messages from send2Vnmr (M)
listenon	Enable receipt of messages from send2Vnmr (M)
lkof	Track changes in lock frequency (P)
ll2d	Automatic and interactive 2D peak picking (C)
ll2dbackup	Copy current ll2d peak file to another file (M)
ll2dmode	Control display of peaks picked by ll2d (P)
llamp	List of line amplitudes (P)
llfrq	List of line frequencies (P)
ln	Find natural logarithm of a number (C)
load	Load status of displayed shims (P)
loadcolors	Load colors for graphics window and plotters (M)
loc	Location of sample in tray (P)
locaction	Locator action (M)
lock	Submit an Autolock experiment to acquisition (C)
lockacqtc	Lock loop time constant during acquisition (P)
lockfreq	Lock frequency (P)
lockgain	Lock gain (P)
lockphase	Lock phase (P)
lockpower	Lock power (P)
locktc	Lock time constant (P)
logate	Transmitter local oscillator gate (P)
lookup	Look up words and lines from a text file (C)
locprotoexec	Execute a protocol from the locator (M)
lp	First-order phase in directly detected dimension (P)

L

lp1	First-order phase in 1st indirectly detected dimension (P)
lp2	First-order phase in 2nd indirectly detected dimension (P)
lpalg	LP algorithm in np dimension (P)
lpalg1	LP algorithm in ni dimension (P)
lpalg2	LP algorithm in ni2 dimension (P)
lpext	LP data extension in np dimension (P)
lpext1	LP data extension in ni dimension (P)
lpext2	LP data extension in ni2 dimension (P)
lpfilt	LP coefficients to calculate in np dimension (P)
lpfilt1	LP coefficients to calculate in ni dimension (P)
lpfilt2	LP coefficients to calculate in ni2 dimension (P)
lpnupts	LP number of data points in np dimension (P)
lpnupts1	LP number of data points in ni dimension (P)
lpnupts2	LP number of data points in ni2 dimension (P)
lpopt	LP algorithm data extension in np dimension (P)
lpopt1	LP algorithm data extension in ni dimension (P)
lpopt2	LP algorithm data extension in ni2 dimension (P)
lpprint	LP print output for np dimension (P)
lpprint1	LP print output for ni dimension (P)
lpprint2	LP print output for ni2 dimension (P)
lptrace	LP output spectrum in np dimension (P)
lptrace1	LP output spectrum in ni dimension (P)
lptrace2	LP output spectrum in ni2 dimension (P)
ls	List files in directory (C)
lsfid	Number of complex points to left-shift the np FID (P)
lsfid1	Number of complex points to left-shift ni interferogram (P)
lsfid2	Number of complex points to left-shift ni2 interferogram (P)
lsfrq	Frequency shift of the fn spectrum (P)
lsfrq1	Frequency shift of the fn1 spectrum (P)
lsfrq2	Frequency shift of the fn2 spectrum (P)
lvl	Zero-order baseline correction (P)
lvltlt	Control sensitivity of lvl and tlt adjustments (P)

lastlk — Last lock solvent used (P)

Description: Contains the name of the last lock solvent. Intended for use with the optional sample changer, this parameter is a user global variable (stored in the user's `global` file) and is not accessible to multiple users simultaneously. On a multiuser automation run, you should preferably access the last lock solvent from the file `/vnmr/acqqueue/lastlk`.

Values: String containing the name of the solvent.

See also: *NMR Spectroscopy User Guide*

Related: `solvent` Lock solvent (P)

lastmenu — Menu to display when Return button is selected (P)

Description: Contains the name of the menu to display when the Return button is clicked on certain menus. For example, if the Phase F2 button in the 2D Processing menu (controlled by the file `process_2D`) is clicked, `lastmenu` is set to `'process_2D'`, the `ft` and `aph` commands are executed, the `ds` window is opened, and the Interactive 1D Spectrum Display menu (`ds_1` file) is displayed. Appearing in this menu is a Return button. Because `lastmenu` is still set to `'process_2D'`, clicking on the Return button redisplays the 2D Processing menu. `lastmenu` is stored in the `$vnmrsys/global` file.

Values: String containing the name of a menu (e.g., `'process_2D'`).

See also: *User Programming*

Related:

`menu`	Change status of menu system (C)
`newmenu`	Select a menu without immediate activation (C)

latch — Frequency synthesizer latching (P)

Description: Configuration parameter for whether the PTS frequency synthesizer has latching capabilities (all digits of the frequency value are sent to the synthesizer at once). The value for each channel is by the Latching label in the Spectrometer Configuration window.

Values: `'n'` indicates the synthesizers do not have latching capabilities (Not Present choice from the Spectrometer Configuration window).
`'y'` indicates the synthesizers have latching capabilities (Present choice from the Spectrometer Configuration window).

See also: *VnmrJ Installation and Administration*

Related:

`config`	Display current configuration and possibly change it (M)

lb — Line broadening in directly detected dimension (P)

Description: Sets line broadening and exponential weighting along the directly detected dimension. This dimension is often referred to as the f_2 dimension in 2D data sets, the f_3 dimension in 3D data sets, etc.

Values: A positive value gives the desired line broadening, in Hz, which is then used to calculate a decaying exponential function of the form `exp(-t*π*lb)`.

A negative value gives a resolution enhancement function (increasing exponential) of the form `exp(-t*π*lb)`.

`'n'` turns off line broadening and exponential weighting.

See also: *NMR Spectroscopy User Guide*

Related:

`exp`	Find exponential value of a number (C)
`lb1`	Line broadening in 1st indirectly detected dimension (P)
`lb2`	Line broadening in 2nd indirectly detected dimension (P)

lb1 — Line broadening in 1st indirectly detected dimension (P)

Description: Sets line broadening and exponential weighting along the first indirectly detected dimension. This dimension is often referred to as the f_1 dimension in multidimensional data sets. `lb1` works analogously to the parameter `lb`. The "conventional" parameters (`lb`, `gf`, etc.) operate on the detected FIDs, while this "2D" parameter is used during processing of the interferograms.

Values: A positive value gives the desired line broadening, in Hz, which is then used to calculate a decaying exponential function of the form `exp(-t*π*lb1)`. A typical value is between 0.0001 to 1000 Hz.

A negative value gives a resolution enhancement function (increasing `exponential) of the form exp(-t*p*lb1)`.

`'n'` turns off line broadening and exponential weighting.

See also: *NMR Spectroscopy User Guide*

Related:

`exp`	Find exponential value of a number (C)
`lb`	Line broadening in directly detected dimension (P)
`lb2`	Line broadening in 2nd indirectly detected dimension (P)

`lb2` Line broadening in 2nd indirectly detected dimension (P)

Description: Sets line broadening and exponential weighting along the second indirectly detected dimension. This dimension is often referred to as the f_2 dimension in multidimensional data sets. `lb2` works analogously to the parameter `lb`. `lb2` can be set with `wti` on the 2D interferogram data.

Values: A positive value gives the desired line broadening, in Hz, which is then used to calculate a decaying exponential function of the form `exp(-t*π*lb2)`.

A negative value gives a resolution enhancement function (increasing exponential) of the form `exp(-t*π*lb2)`.

`'n'` turns off line broadening and exponential weighting.

See also: *NMR Spectroscopy User Guide*

Related:

`exp`	Find exponential value of a number (C)
`lb`	Line broadening in directly detected dimension (P)
`wti`	Interactive weighting (C)

`lc1d` Pulse sequence for LC-NMR (M)

Applicability: Systems with LC-NMR accessory.

Description: Creates parameters to set up a pulse sequence that can be used to start an LC-NMR run, including triggering the injection of a sample, and can be used also to obtain multiple solvent-suppressed spectra using multi frequency Shifted Laminar Pulses (SLP) and gradients. The sequence is coded without a `d2` variable, thus allowing `ni` to be used to obtain a series of spectra without resulting in any delay in the sequence being incremented.

The sequence requires a phase table, `lc1d`, to be found in the `tablib` directory. Phases of the selective pulses, the observe pulse, and the receiver and separately controlled by phase variables.

Note that the `lc1d` sequence uses power scaling of shaped pulses, which is supported starting in VnmrJ 5.2. Because of this feature, this sequence *will not run* in earlier versions of VnmrJ.

`lcpar2d` Create 2D LC-NMR acquisition parameters (M)

Applicability: Systems with LC-NMR accessory.

Description: Creates the acquisition parameters `ni`, `sw1`, and `phase`, which can be used to acquire a 2D LC-NMR data set. `lcpar2d` is functionally the same as `addpar('2d')`.

Related:

`addpar`	Add selected parameters to current experiment (M)
`lcset2d`	General setup for 2D LC-NMR experiments (M)

lcpeak — Peak number (P)

Applicability: Systems with LC-NMR accessory.

Description: Contains the number of the peak being sensed or the loop being flushed.

lcplot — Plot LC-NMR data (M)

Applicability: Systems with LC-NMR accessory.

Syntax: `lcplot`

Description: Plots LC-NMR data. This macro is executed with the Plot LC-NMR button on the Spare pane when LC-NMR is active.

lcpsgset — Set up parameters for various LC-NMR pulse sequences (M)

Applicability: Systems with LC-NMR accessory.

Syntax: `lcpsgset(file,parameter1,parameter2,...,parameterN)`

Description: Sets up parameters for various LC-NMR pulse sequences using information in a `parlib` file. Rather than returning the entire parameter file, `lcpsgset` returns the parameters listed. `lcpsgset`, in general, is never entered from the keyboard but is used as part of experiment setup macros.

Arguments: `file` is the file from the user or system `parlib` that provides information on setting up parameters listed. The parameters `seqfil` and `pslabel` are set to the supplied file name.

`parameter1,parameter1,...,parameterN` are 1 to 11 parameters to be returned from the `parlib` file.

Examples: `lcpsgset('lccosy','ds','ap','ss','d1','axis','phase')`

lcset2d — General setup for 2D LC-NMR experiments (M)

Applicability: Systems with LC-NMR accessory.

Syntax: `lcset2d(experiment<,F2_dig_res<,F1_dig_res>>)`

Description: Runs the macro `lcpar2d` to create new parameters needed for 2D LC-NMR experiments, then selects starting values for a number of parameters. The `lcset2d` macro is "internal" and not normally entered directly by the user.

Arguments: `experiment` is the name of a 2D LC-NMR experiment.

`F2_dig_res` is the f_2 digital resolution desired, in Hz/pt.

`F1_dig_res` is the f_1 digital resolution desired, in Hz/pt.

Examples: `lcset2d('lcnoesy')`

left — Set display limits to left half of screen (C)

Description: Sets the horizontal control parameters `sc` and `wc` to produce a display (and subsequent plot) in the left half of a screen (and page). For 2D data, space is left for the scales.

Related:

`center`	Set display limits for center of screen (C)
`full`	Set display limits for a full screen (C)
`fullt`	Set display limits for full screen with room for traces (C)
`right`	Set display limits for right half of screen (C)

L

legrelay — **Independent control of magnet leg relay (P)**

Description: Gives override capability over the magnetic leg high and low (broad) band rf signal routing. This parameter does not normally exist but can be created by the user with the command `create('legrelay','string')`.

The `legrelay` override is operational only on standard systems shipped starting in November 1990 and on certain special systems shipped before that date. A system includes the override capability if it uses N-type connectors instead by BNC connectors on the magnet leg.

Values: `'n'` indicates normal logic is used to set the leg relay.

`'h'` indicates the leg relay is set to the high band.

`'l'` indicates the leg relay is set to the low (broad) band.

Any other value results in an error message and an abort of pulse sequence generation.

See also: *User Programming*

Related: `create` Create new parameter in a parameter tree (C)

length — **Determine length of a string (C)**

Syntax: `length(string):$string_length`

Description: Returns the length in characters of a specified string.

Arguments: `string` is zero or more characters enclosed in single quotes.

`string_length` is the number of characters (a real number) in `string`.

Examples:
```
length('abc'):r1
length(solvent):$len
```

See also: *User Programming*

Related: `substr` Select a substring from a string (C)

lf — **List files in directory (C)**

Syntax: `lf<(directory)>`

Description: Lists the files in a directory, with output on the text output window. Directories are suffixed by "/", executable files by "*", and links by "@".

Arguments: `directory` is the name of a directory. The default is the current working directory. `lf` is equivalent to the UNIX command `ls -F` and uses the same options (e.g., `-l` for a long listing such as `lf('-l *.fid')`).

Examples:
```
lf
lf('data'))
lf('-l *.fid')
```

See also: *NMR Spectroscopy User Guide*

Related: `dir` List files in directory (C)
`ls` List files in directory (C)

liamp — **Amplitudes of integral reset points (P)**

Description: Stores the integral amplitudes at the integral reset points for a list of integrals. To display the values of `liamp`, enter `display('liamp')`. Values of `liamp` can also be accessed in MAGICAL macros using, for example, `liamp[$i]`. Values are stored as absolute numbers (summations of data point values) and, as such, are a function of the parameter `fn`. The values displayed

by the dli, pir, and dpir programs are related to liamp values by the relationship:

Displayed or plotted integral = liamp[i]*is/(fn/128)*ins)

See also: *NMR Spectroscopy User Guide*

Related:

display	Display parameters and their attributes (C)
dli	Display list of integrals (C)
dpir	Display integral amplitudes below spectrum (C)
fn	Fourier number in directly detected dimension (P)
lifrq	Frequencies of integral reset points (P)
pir	Plot integral amplitudes below spectrum (C)

lifrq — Frequencies of integral reset points (P)

Description: Stores the frequencies of integral reset points for a list of integrals. The frequencies are stored in Hz and are *not* adjusted by the reference parameters rfl and rfp.

See also: *NMR Spectroscopy User Guide*

Related:

liamp	Amplitudes of integral reset points (P)
rfl	Ref. peak position in directly detected dimension (P)
rfp	Ref. peak frequency in directly detected dimension (P)

liqbear — Liquids Bearing Air Level (P)

Description: This global parameter is the DAC value used when the liquids spinner bearing air is turned on. If the parameter does not exist the value defaults to 0xc000. To create the parameter:

```
create('liqbear','integer','global')
setlimit('liqbear',65535,0,1,'global')
```

Values: 0 - 65535

listenoff — Disable receipt of messages from send2Vnmr (M)

Description: Deletes the file $vnmruser/.talk, thereby disallowing send2Vnmr to send commands to VnmrJ

See also: *User Programming*

Related:

listenon	Enable receipt of messages from send2Vnmr (M)
send2vnmr	Send a command to VnmrJ (U)

listenon — Enable receipt of messages from send2Vnmr (M)

Description: Writes files with the VnmrJ port number that /vnmr/bin/send2Vnmr needs to talk to VnmrJ. The command then to send commands to VnmrJ is /vnmr/bin/send2Vnmr $vnmruser/.talk command.

See also: *User Programming*

Related:

listenoff	Disable receipt of messages from send2Vnmr (M)
send2vnmr	Send a command to VnmrJ (U)

lkof — Track changes in lock frequency (P)

Description: Tracks changes in the lock frequency resulting from changes in the solvent, and minor changes caused by the magnet drifting. The frequency units for lkof are in Hz, analogous to sfrq and tof, or dfrq and dof. lkof affects two

components of the system: autolock on the console and acqi on the host computer. If lkof exists, it offsets the current value of the lockfreq parameter.

See also: *NMR Spectroscopy User Guide*

Related: lockfreq Lock frequency (P)

ll2d Automatic and interactive 2D peak picking (C)

Syntax: (1) ll2d<(options)><:$num>

(2) ll2d('info'<,#>):$peak_number,$f1,$f2,$amplitude, $volume,$label,$comment,$FWHH1,$FWHH2,$f1_min, $f1_max,$f2_min,$f2_max

Description: Automatically finds and integrates peaks that are above the threshold th in a 2D spectrum or a 2D plane of a 3D spectrum, and writes the peak location, volume, full-width at half-height (FWHH), volume, and the boundaries of the integrated region to a file in the ll2d subdirectory of the current experiment directory. For 2D spectra, the file name is peaks.bin, and for 2D planes of 3D spectra, the file name is peaks_f#f#_#.bin, where f#f# gives the plane direction (e.g., f1f3) and the final # gives the number of the plane. For easy import and export of peak data, ll2d also allows insertion and deletion of peaks interactively as well as reading and writing of text peak files.

Two-dimensional volumes are scaled in a manner analogous to 1D integrals, using the parameters ins2 and ins2ref. The ins2ref parameter is the Fourier number scaled value of a selected volume. The reported value of a peak volume is (*unscaled volume*) × ins2/ins2ref/fn/fn1. The unscaled volume of a peak can be obtained from the command ll2d('info',peak#). ins2ref can be set to the unscaled value divided by fn and fn1. The report volume for that peak is then the value of ins2.

Arguments: options (syntax 1) are any of the following (dconi is not necessarily active):

- 'adjust' is a keyword to adjust the bounds of all peaks in the displayed area so that no boundaries overlap, and then to recalculate peak volumes.
- 'draw' is a keyword to draw the peaks, boxes, numbers, and labels on the spectrum based on the value of the parameter ll2dmode.
- 'info','total' displays the total number of peaks in the current peak table. If a single return value is requested, printing is suppressed and the total number of peaks is returned.
- 'peaks' is a keyword to find all peaks in the displayed area above a threshold th. If dconi is active and in the box mode, ll2d finds peaks only in the area defined by the cursors. The 'peaks' option is the default if no arguments are entered.
- 'pos' or 'neg' keywords can be used in addition to 'peak', 'volume', or 'clear' to operate only on positive or negative peaks.
- 'read'<,file > reads in a binary peak file, where file is the name of the peak file. If a full path is not specified, the file is searched for first in the current working directory and then in the ll2d subdirectory of the current experiment directory.
- 'readtext'<,file> reads in a text peak file, where file is the name of the peak file. If a full path is not specified, the file is searched for first in the current working directory and then in the ll2d subdirectory of the current experiment directory.

- 'reset' is a keyword to delete all peaks in the peak table.
- 'volume' is a keyword to find the bounds of each peak in the displayed area and integrate this area.
- 'writetext'<,file> writes a peak file to a text file, where file is the name of the text file written. If a full path is not specified, the file is written in the current working directory.

options (syntax 1) can also be any of the following (dconi must be active):

- 'clear' is a keyword to delete all peaks in the displayed region if in the dconi cursor mode, or to delete all peaks within the cursors if in the dconi box mode.
- 'combine' is a keyword to combine all peaks within the area defined by the cursors into a single peak (in dconi box mode only). The center of the new peak is at the average of all combined peaks' centers, and the bounds of this peak contains the maximum extents of the combined peaks' bounds. If all combined peaks have the same label, this label is assigned to the new peak. ***CAUTION:*** **All individual peaks to be combined are deleted prior to the creation of the new combination peak, and there is no automatic way to restore the original peaks. Therefore, it is recommended that you make a backup copy of the peak file prior to using this option.**
- 'comment' is a keyword to prompt for an 80-character comment. The comment is assigned to the nearest peak in the dconi cursor mode or to all peaks within the cursors in the dconi box mode.
- 'comment',text executes the 'comment' option using the string entered for text instead of prompting for a comment.
- 'label' is a keyword to prompt for a 15-character label. The label is assigned to the nearest peak in dconi cursor mode or assigned to all peaks within the cursors in dconi box mode. To erase an existing label, enter a label consisting of one or more spaces.
- 'label',text executes the 'label' option using the string entered for text instead of prompting for a label.
- 'mark' is a keyword to insert a peak at the current cursor position if in the dconi cursor mode. If in the dconi box mode, 'mark' is a keyword to integrate the area within the cursors and assign that area to all peaks within the cursors that do not have their bounds already defined. If there are no peaks within the area defined by the cursors, using 'mark' finds the highest point within this area, marks that as a peak, integrates the area within the cursors, and assigns that area to the peak. The displayed values of the volume integrals are scaled by ins2 and ins2ref and the Fourier number of the 2D experiment.
- 'unmark' is a keyword to delete the nearest peak if in dconi cursor mode. If in the dconi box mode, 'unmark' deletes all peak bounds that are completely within the area defined by the cursors. Peaks are not deleted in the box mode.

options (syntax 1) also can be any of the following (dconi does not have to be active because ll2d is executed on a peak number):

- 'combine',#1,#2,... executes the 'combine' option on the list of peak numbers that follow the 'combine' keyword. If a single return value is requested, the peak number of the new combination peak is returned.

- 'comment',text,# executes the 'comment' option on peak # using the string entered for text instead of prompting for a comment.
- 'label',text,# executes the 'label' option on peak # using the string entered for text instead of prompting for a label.
- 'unmark',# deletes peak number #.

$num (syntax 1) is a return value set to the total number of peaks that have been picked unless the arguments 'combine',#1,#2,... are used, in which case $num is the number of the newly created combination peak.

Syntax 2 arguments are the following:

- 'info'<,#> displays information in the text window about peak number #. If no peak number is included, dconi must be active and the default is the peak nearest to the cursor. If return values are requested, the display is suppressed.
- $peak_number is a return value set to the number of the peak, either the second argument # or, if no value is given for #, the peak nearest to the cursor in dconi.
- $f1 and $f2 are return values set to the peak frequencies in f_1 and f_2 of peak $peak_number.
- $amp is a return value set to the amplitude of peak $peak_number.
- $vol is a return value set to the unscaled volume of $peak_number. peak. This value can be used to set the ins2ref parameter.
- $label is a return value set to the label of peak $peak_number.
- $comment is a return value set to the comment about $peak_number.
- $FWHH1 and $FWHH2 are return values set to full-width at half-height of $peak_number.
- $f1_min,$f1_max,$f2_min,$f2_max are return values set to the bounds of $peak_number.

Examples:

```
ll2d
ll2d:$npeaks
ll2d('volume')
ll2d('read','peaklist.inp')
ll2d('mark')
ll2d('label','Peak 1')
ll2d('info','total'):$npeaks
ll2d('combine',3,4,5,6):$cpn
ll2d('info',3):$num,$f1,$f2,$amp,$vol,$label
```

See also: *NMR Spectroscopy User Guide*

Related:

dconi	Interactive 2D contour display (C)
ins2	2D volume value (P)
ins2ref	Fourier number scaled volume of a peak (P)
ll2dbackup	Copy current ll2d peak file to another file (M)
ll2dmode	Control display of peaks picked by ll2d (P)
parll2d	Create parameters for 2D peak picking (M)
pll2d	Plot results of 2D peak picking (C)
th	Threshold (P)
th2d	Threshold for integrating peaks in 2D spectra (P)
xdiag	Threshold for excluding diagonal peaks when peak picking (P)

ll2dbackup — Copy current ll2d peak file to another file (M)

Syntax: `ll2dbackup<(file)>`

Description: Backs up the current `ll2d` peak file by copying it to a file with a different file name. The default `ll2d` peak file is `peaks.bin` for 2D data.

Arguments: `file` is the name to be given to the backup file. If a full path is not specified, the file is written to the current working directory. If no argument is provided, the system prompts for a file name. If no file name is specified at the prompt, the default `ll2d` peak file name with `.bck` appended is used.

See also: *NMR Spectroscopy User Guide*

Related:

`ll2d`	Automatic and interactive 2D peak picking (C)

ll2dmode — Control display of peaks picked by ll2d (P)

Description: Sets the display attributes of peaks picked by the `ll2d` command

Values: A string variable composed of 4 characters, with each character taking the value `'y'` (display the peak attribute) or `'n'` (do not display the attribute). The first character determines if a "+" is drawn on the screen in `dconi` displays to mark peaks, the second character controls the drawing of the peak number, the third character controls drawing of the peak bounds box, and the last character controls drawing of the peak label.

See also: *NMR Spectroscopy User Guide*

Related:

`ll2d`	Automatic and interactive 2D peak picking (C)

llamp — List of line amplitudes (P)

Description: Stores a list of line amplitudes above the threshold set by `th`.

See also: *NMR Spectroscopy User Guide*

Related:

`dll`	Display listed line frequencies and intensities (C
`llfrq`	List of line frequencies (P)
`th`	Threshold (P)

llfrq — List of line frequencies (P)

Description: Stores a list of line frequencies above the threshold set by `th`. Frequencies are stored in Hz and are *not* adjusted by reference parameters `rfl` and `rfp`.

See also: *NMR Spectroscopy User Guide*

Related:

`llamp`	List of line amplitudes (P)
`rfl`	Ref. peak position in directly detected dimension (P)
`rfp`	Ref. peak frequency in directly detected dimension (P)
`th`	Threshold (P)

ln — Find natural logarithm of a number (C)

Syntax: `ln(value)<:n>`

Description: Finds the natural logarithm (base e) of a number. To convert the value to base 10, use $log_{10}x = 0.43429*ln(x)$.

Arguments: `value` is a number.

`n` is the return value giving the logarithm of `value`. The default is to display the logarithmic value in the status window.

L

Examples: `ln(.5)`
`ln(val):ln_val`

See also: *User Programming*

Related:

`atan`	Find arc tangent of a number (C)
`cos`	Find cosine value of an angle (C)
`exp`	Find exponential value of a number (C)
`sin`	Find sine value of an angle (C)
`tan`	Find tangent value of an angle (C)

`load` Load status of displayed shims (P)

Description: Sets whether shim values are used. `load` is automatically set to `'y'` by the `rts` and is automatically set to `'n'` by `su`, `go`, `au`, and `shim`. Shim DAC values are automatically loaded after the console is rebooted (the last values returned before the console was rebooted).

Values: `'y'` begins any noninteractive shimming process or data acquisition after loading the shim DACs with the shim values from the current experiment. It also prevents `acqi` from delivering shim values to that experiment.

`'n'` begins any noninteractive shimming process or data acquisition with the current values stored in the shim DACs. Shim values in the current experiment are ignored.

See also: *NMR Spectroscopy User Guide*

Related:

`acqi`	Interactive acquisition display process (C)
`au`	Submit experiment to acquisition and process data (C)
`go`	Submit experiment to acquisition (C)
`rts`	Retrieve shim coil settings (C)
`shim`	Submit an autoshim experiment to acquisition (C)
`su`	Submit a setup experiment to acquisition (M)

`loadcolors` Load colors for graphics window and plotters (M)

Syntax: `loadcolors<(color_file)>`

Description: Loads the color table for VnmrJ graphics window and plotters. `loadcolors` is generated by the `color` program and includes a series of `setcolor` commands. On bootup, the `bootup` macro calls `loadcolors` to set the graphics and plotter colors.

The `loadcolors` macro checks the value of `maxpen` to decide if the plotter supports colors. If `maxpen` is greater than 1, a color printer is configured.

Arguments: `color_file` is the name of the file to load. `loadcolors` first searches for this file in the directory `$vnmruser/templates/` directory. If not found there, `loadcolors` then searches the `user_templates/vnmr` directory. The default is a color table with the same name as the value of the plotter parameter that `loadcolors` searches for in the same two directories.

Examples: `loadcolors`
`loadcolors('mycolortable')`

See also: *VnmrJ Imaging NMR*

Related:

`bootup`	Macro executed automatically when VnmrJ activated (M)
`color`	Select plotting colors from a graphic interface (M)
`maxpen`	Maximum number of pens to use (P)
`setcolor`	Set colors for graphics window and for plotters (C)

loc — Location of sample in tray (P)

Description: Indicates whether a sample changer is present and enabled, present but disabled, or not present. If the changer is present and enabled, the value of `loc` sets the location in the tray of the sample in use or to be used. The `loc` parameter is stored in the global tree. When an acquisition is started, certain global parameters, including `loc`, are saved with the experiment parameters. The `saveglobal` parameter specifies which global parameters are saved.

The `auto_au` macro controls most of the automation features, including setting the value of `loc`.

Values: A number between 1 and `traymax` indicates the sample location.

0 indicates the changer is not present or disabled.

See also: *NMR Spectroscopy User Guide; VnmrJ Walkup*

Related:

`auto_au`	Controlling macro for automation (M)
`saveglobal`	Save selected parameters from global tree (P)
`traymax`	Sample changer tray size (P)

locaction — Locator action (M)

Description: Perform an action on an object in the locator database. The action depends on the type of object selected, the action performed, and the target selected for the action.

Related:

`dndfid`	Retrieve and process fid data from the locator (M)
`dndjoin`	Join a work space from the locator (M)
`dndpar`	Retrieve a parameter set from the locator (M)
`dndshims`	Retrieve a shimset set from the locator (M)
`locprotoexec`	Execute a protocol from the locator (M)
`xmmakenode`	Make a new study queue node (M)

lock — Submit an Autolock experiment to acquisition (C)

Description: Performs an automatic locking operation using the acquisition computer, optimizing lock power, phase, and gain. If necessary, `lock` obtains lock through a software-controlled search. `lock` is the only method to automatically adjust lock phase (usually needed only after probe change or lock channel tuning). `lock` also sets the rf frequencies, decoupler status, and temperature.

See also: *NMR Spectroscopy User Guide*

Related:

`au`	Submit experiment to acquisition and process data (C)
`change`	Submit a change sample experiment to acquisition (M)
`ga`	Submit experiment to acquisition and FT the result (C)
`go`	Submit experiment to acquisition (C)
`sample`	Submit change sample, autoshim experiment to acquisition (M)
`shim`	Submit an Autoshim experiment to acquisition (C)
`spin`	Submit a spin setup experiment to acquisition (C)
`su`	Submit a setup experiment to acquisition (M)

lockacqtc — Lock loop time constant during acquisition (P)

Description: Controls time constant of lock loop during acquisition (i.e., time constant by which the lock feedback corrects disturbances of the magnetic field).

Values: 1, 2, 3, or 4 (where 1 sets 1.2 seconds, 2 sets 4.7 seconds, 3 sets 12 seconds, and 4 sets 48 seconds).

If `lockacqtc` does not exist, it is set to 48 seconds. All systems are designed to work well with the default settings, and there should rarely be a reason to alter the lock time constant. However, to experiment with other values, create `lockacqtc` and set a new value:

```
create('lockacqtc','integer','global')
setlimit('lockacqtc',4,1,1,'global') lockacqtc=n
```

where *n* is the new value.

See also: *NMR Spectroscopy User Guide*

Related:

`create`	Create new parameter in a parameter tree (C)
`locktc`	Lock time constant (P)
`setlimit`	Set limits of a parameter in a tree (C)

`lockfreq` Lock frequency (P)

Description: Sets system lock frequency. The value is entered using the Lock Frequency label in Spectrometer Configuration window. **The value of lockfreq must be set correctly in order to observe NMR signals.**

`lockfreq` can find the lock signal or resonance. Traditionally, Varian spectrometers have used the parameter `z0` for this purpose; however, using `lockfreq` can require less shimming when switching solvents and less adjustment to the lock phase. To use `lockfreq`, set `z0='n'`.

Values: 1 to 160 (in MHz), `'n'`

Use the true ^{2}H frequency. Typical values of `lockfreq` are shown in the chart below.

^{1}H Frequency		
200	30.710	30.6976
300	46.044	46.0625
400	61.395	61.471
500	76.729	...
600	92.095	...
750	115.250	...

Refer to the manual *VnmrJ Installation and Administration* for details on finding the correct lock frequency.

The commands; `go`, `lock`, `shim`, and `su` reset the lock frequency in the console to the current value of `lockfreq`. Lock frequency in the console can be set with the `sethw` command.

`lockfreq` is offset by the value of `lkof`, if that parameter exists, but `sethw` directly uses its numeric argument, without any offset by `lkof`.

See also: *VnmrJ Installation and Administration*; *NMR Spectroscopy User Guide*

Related:

`config`	Display current configuration and possibly change it (M)
`go`	Submit experiment to acquisition (M)
`lkof`	Track changes in lock frequency (P)
`lock`	Submit an Autolock experiment to acquisition (C)
`sethw`	Set values for hardware in acquisition system (C)
`setlockfreq`	Set lock frequency (C)
`shim`	Submit an Autoshim experiment to acquisition (C)
`su`	Submit a setup experiment to acquisition (M)
`z0`	Z0 field position (P)

lockgain — Lock gain (P)

Description: Contains the current lock gain value as set by computer control. The value is stored in `vnmrsys/global` and can be examined by typing `lockgain?`.

Values: 0 to 48 dB, in 1-dB steps.

See also: *NMR Spectroscopy User Guide*

lockphase — Lock phase (P)

Description: Contains the current lock phase. The value is stored in `vnmrsys/global` and can be examined by typing `lockphase?`.

Values: 0 to 360, in degrees, in 1.4-degree steps.

See also: *NMR Spectroscopy User Guide*

lockpower — Lock power (P)

Description: Contains the current lock power value as set by computer control. The value is stored in `vnmrsys/global` and can be examined by typing `lockpower?`.

Values: 0 to 68 dB, in 1-dB steps, 68 is full power.

See also: *NMR Spectroscopy User Guide*

locktc — Lock time constant (P)

Description: Controls lock loop time constant when system is not performing acquisition (idle, lock display, shim display, FID display, autoshim, autolock, etc.).

Values: 1, 2, 3, or 4 (where 1 corresponds to 1.2 seconds, 2 to 4.7 seconds, 3 to 12 seconds, and 4 to 48 seconds). If `locktc` does not exist, the system uses a value of 1, the fastest value. To experiment with other value, create `locktc` and set a value (e.g., `create('locktc','integer','global') setlimit('locktc',4,1,'global') locktc=2`).

See also: *NMR Spectroscopy User Guide*

Related:

`create`	Create new parameter in a parameter tree (C)
`lockacqtc`	Lock acquisition time constant (P)
`setlimit`	Set limits of a parameter in a tree (C)

logate — Transmitter local oscillator gate (P)

Description: Specifies whether the transmitter local oscillator (L.O.) is gated with the transmitter rf output or with the transmitter I.F. (intermediate frequency).

The `logate` parameter does not exist in most parameter sets; the system internally sets it to `'l'`. To use the value `'s'`, create `logate` and change the value by entering: `create('logate','string') setenumeral('logate',2,'l','s') logate='s'`.

Values: `'l'` makes the transmitter L.O. gate with the rf output, producing better signal-to-noise, usually most important in liquids NMR.

`'s'` makes the transmitter L.O. gate with the I.F. signal, producing sharper pulses, especially important in solid-state NMR.

See also: *User Guide: Solid-State NMR*

Related:

`create`	Create new parameter in a parameter tree (C)
`setenumeral`	Set values of a string variable in a tree (C)

L

lookup — Look up words and lines from a text file (C)

Applicability: VnmrJ

Syntax: `lookup('codeword',argument<,'codeword',argument<,...>>):$n1<$n2<,...>>`

Description: Search a text file or files for a word or any string of characters delimited by white space characters (space character, a tab, a new line, a carriage return, or a comma) or codeword and return to the user subsequent words or lines.

The white space characters may be specified. Punctuation marks, unless they are defined as white space as the comma is by default, also form words or are part of a word. A line is any string of characters from the current word to the next carriage return. A line will include all "white space" characters except the carriage return. Depending on the codeword, word searches and word counts can be case insensitive or case sensitive.

The codewords `mfile` and `filekey` implement multiple text file lookup and `lookup` reads the contents of the specified files.

The `mfile` and `file` keywords are used together to keep track of various locations within a single file to restart the search from that location.

The first time a file is selected, or the search is restarted at the beginning of the file, use the name of the file instead of the `filekey`. Subsequent calls to `lookup` on this file use the value returned by the `filekey` codeword as the argument following the `mfile` codeword. The `mfile` codeword resets the white space to the default values.

Arguments: Default white space characters: space character, tab, new line, carriage return, or comma.

`file` codeword specifies that the next supplied argument is the name of the active text file. This codeword must be the first argument and the file name must be the second argument passed to `lookup`. The search through a text file is a top to bottom search. The `file` codeword resets the search to start from the top of the text file. Subsequent searches through a previously accessed text file will continue from where the previous search stopped provided the `file` codeword is not used. The `file` codeword resets the white space characters to their default values.

`mfile` codeword specifies that the next supplied argument is the `filekey` to select one of multiple text files to access. This codeword must be first argument and the `filekey` must be the second argument passed to `lookup` if `mfile` is used.

`seek` this codeword causes the `lookup` program to search the text file for words which match those supplied as arguments following the `seek` codeword. An implicit `seek` is initially assumed for each call to `lookup`. The `lookup` program maintains a pointer to the word following the last successful `seek`. The first argument following an explicit `seek` codeword is interpreted as a word to search for and not a codeword. The second or later argument following an explicit `seek` is interpreted as a codeword if it matches one of the nine cases. Therefore, for example, one can search for the word `file` without having it interpreted as a codeword by having it immediately follow the `seek` codeword in the argument list. This seek is case insensitive.

`seekcs` this codeword is the case sensitive equivalent to the `seek` codeword and follows the same rules as `seek`. Alternate case sensitive and case insensitive searches are allowed.

`skip` increments the word pointer to the next word in the text file. This codeword may optionally be followed by a number which will specify how many words to skip.

`read` returns to the user the word currently being pointed to and increments the pointer to the next word in the text file. This codeword may optionally be followed by a number which will specify how many words to return to the user.

`readline` returns to the user the word currently being pointed to and all following words until the end of the current line. The pointer is moves to the first word of the next line in the text file. This codeword may optionally be followed by a number which will specify how many lines to return to the user.

`count` returns to the user the number of times words in the text file match the subsequent argument. The count starts at the current word pointer and proceeds to the end of the text file. The word `count` is not case sensitive.

`countcs` this codeword is the case sensitive equivalent to the count codeword. In all other respects, it is the same as `count`.

`delimiter` this codeword specifies that the next supplied argument is a list of characters which are used to identify the white space used to identify words.

Characters are specified by the following:
`\n` — new line
`\t` — tab
`\r` — carriage return
`\\` — backslash
`\'` — single quote.

The two arguments `delimiter,' \t\n\r',` reselect the default white space. The `file` codeword will also reselect the default white space. The distinction is that the `file` codeword restarts the search from the beginning of the file while the `delimiter` codeword continues from the current search position. An implicit `seek` is applied following the `'delimiter'` codeword and argument.

`filekey` returns the current location within the file being accessed. Combined with the `mfile` codeword, a subsequent call to `lookup` starts the search at the location within the file specified by the value of `filekey`. The `filekey` serves both as a pointer to the file and as the character offset within that file.

Examples: `lookup('file',systemdir + '/manual/lookup')`
Select this file for the search.

```
lookup('user','skip',2,'read',2,'readline'):$n1,$n2,
$n3,$ret
```
Seek is assumed with the call to `lookup`. Finding the word `user` the next instruction,`'skip',2`, causes the pointer to jump two words. The codeword `read` causes the word to be put into `$n1`. The argument 2 specifies two words to be read into `$n2`. The word pointer now points to the next. The codeword `readline` causes the remaining characters up to the next carriage return to be placed in `$n3`. The pointer now points to the first word in the next line. The variable `$ret` is set to the number of arguments successfully returned from the text file and is used to determine if the end of the text file has been reached.

```
lookup('skip',8,'read','skip',3,'read',2,'seek','com
ma'):$n3,$n4,$n5
```
`'Skip',8` causes the pointer to jump eight words. The `'read'` sets `$n3` equal to word where the pointer is now located. `'Skip',3` jumps the next three words. `'Read',2` reads two consecutive words and sets `$n4` to the first word and `$n5` equal the second word. The `seek` argument searches for the word `'comma'`. If the word `'comma'` is at the end of a sentence it will not be found because the period is treated (by default) as part of the word. Define the period as a white space and occurrences comma at the end of sentences are also found. The word pointer now points to the next word.

```
lookup('delimiter',' ,\'.\n\t"','seek','file',
'skip',6,'read'):n6
```

The `delimiter` with the argument `' ,\'.\n\t"'` sets white space to space, comma, single quote, period, new line, tab, and double quote. Setting single quotes to white space causes the explicit `seek` to select the next argument `file` as a search word not a codeword. The search for the word `must` matches both MUST and must because `seek` is not case sensitive. `'Skip',6` jumps six words. `Read` sets `$n6` equal to word found between the next set of single quotes because single quotes are defined as white space.

`lookup('seekcs','Test','read'):$n7`
`seekcs` is the case sensitive form of `seek` and searches for the word that is an exact match to the case of `Test` (the argument following the codeword `seekcs`). Finding the word `'Test'`, `read` sets `$n7` to `search`. Any occurrence of the word `test` is skipped.

See also: *User Programming*

Related:

`dialog`	Display a dialog box from a macro (C)
`systemdir`	VnmrJ system directory (P)

`locprotoexec` Execute a protocol from the locator (M)

Description: When a protocol is dragged from the locator and dropped onto the graphics canvas, this macro adds the protocol to the end of the study queue, and executes the macro associated with the protocol.

Related:

`dndfid`	Retrieve and process fid data from the locator (M)
`dndjoin`	Join a work space from the locator (M)
`dndpar`	Retrieve a parameter set from the locator (M)
`dndshims`	Retrieve a shimset set from the locator (M)
`locaction`	Locator action (M)
`xmmakenode`	Make a new study queue node (M)

`lp` First-order phase in directly detected dimension (P)

Description: Specifies the first-order phase-correction angles along the directly detected dimension according to the formula

absorption spectrum(ω) =
real channel(ω) * *sin* θ + *imaginary channel*(ω) * *cos* θ

where the phase angle θ is a function of frequency, i.e.
θ = `rp` + (ω – ω_o) * `lp`

ω_o is defined to be the right end of the spectrum (i.e., `lp` has zero effect at the right edge of the spectrum and a linearly increasing effect going to the left). In multidimensional data sets, `lp` controls the phase of the directly detected dimension: f_2 dimension in 2D data sets, f_3 dimension in 3D data sets, etc.

Values: –3600 to +3600, in degrees. Typical values are between 0 and –180.

See also: *NMR Spectroscopy User Guide*

Related:

`aph`	Automatic phase adjustment of spectra (C)
`lp1`	First-order phase in 1st indirectly detected dimension (P)
`lp2`	First-order phase in 2nd indirectly detected dimension (P)
`rp`	Zero-order phase in directly detected dimension (P)
`setlp0`	Set parameters for zero linear phase (M)

`lp1` First-order phase in 1st indirectly detected dimension (P)

Description: Controls the first-order phase constant along the first indirectly detected dimension during the process of phase-sensitive 2D transformation. The first

indirectly detected dimension is often referred to as the f_1 dimension of a multidimensional data set.

See also: *NMR Spectroscopy User Guide*

Related:

lp	First-order phase in directly detected dimension (P)
lp2	First-order phase in 2nd indirectly detected dimension (P)
rp1	Zero-order phase in 1st indirectly detected dimension (P)

lp2 — First-order phase in 2nd indirectly detected dimension (P)

Description: Controls the first-order phase constant along the second indirectly detected dimension during a ds, dconi, or equivalent display operation on the 2D data or a 1D trace therein. The second indirectly detected dimension is often referred to as the f_2 dimension of a 3D (or higher dimensionality) data set.

See also: *NMR Spectroscopy User Guide*

Related:

dconi	Interactive 2D contour display (C)
ds	Display a spectrum (C)
lp	First-order phase in directly detected dimension (P)
rp2	Zero-order phase in 2nd indirectly detected dimension (P)

lpalg — LP algorithm in np dimension (P)

Description: Specifies the linear prediction (LP) algorithm to use in the np dimension. The resulting LP coefficients are used to appropriately extend the complex time-domain data prior to a normal Fourier transform. The LP algorithms work both on complex t_2 FIDs and on hypercomplex or complex t_1 interferograms. Enter addpar('lp') to create lpalg and other np dimension LP parameters in the current experiment

Values: 'lpfft' does a least-squares calculation of lpfilt complex LP coefficients using lpnupts complex time-domain data points. Eigenvalue decomposition of the least-squares matrix is done using Householder tridiagonalization followed by the QL method with implicit shifts.

'lparfft' does a non-least-squares calculation of lpfilt complex LP coefficients using (lpfilt+1) complex, autoregressive (AR) matrix elements. These AR matrix elements are calculated from the raw, complex time-domain data using lpnupts points.

Note that the 'lpfft' algorithm is preferred by far. While 'lparfft' can model broad lines and can extend data sets when mostly noise exists, it cannot model narrow lines.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
lpalg1	LP algorithm in ni dimension (P)
lpalg2	LP algorithm in ni2 dimension (P)
lpext	LP data extension in np dimension (P)
lpfilt	LP coefficients to calculate in np dimension (P)
lpnupts	LP number of data points in np dimension (P)
lpopt	LP algorithm data extension in np dimension (P)
lpprint	LP print output in np dimension (P)
lptrace	LP output spectrum in np dimension (P)
np	Number of data points (P)
proc	Type of processing on np FID (P)
strtlp	Starting point for LP calculation in np dimension (P)
strtext	Starting point for LP data extension in np dimension (P)

L

lpalg1 — LP algorithm in ni dimension (P)

Description: Specifies the LP (linear prediction) algorithm to use in the ni dimension. lpalg1 functions analogously to lpalg. Enter addpar('lp',1) to create lpalg1 and other ni dimension LP parameters in the current experiment.

Values: 'lpfft' or 'lparfft'

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
lpalg	LP algorithm in np dimension (P)
ni	Number of increments in 1st indirectly detected dimension (P)

lpalg2 — LP algorithm in ni2 dimension (P)

Description: Specifies the LP (linear prediction) algorithm to use in the ni2 dimension. lpalg2 functions analogously to lpalg. Enter addpar('lp',2) to create lpalg2 and other ni2 dimension LP parameters in the current experiment.

Values: 'lpfft' or 'lparfft'

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M
lpalg	LP algorithm in np dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)

lpext — LP data extension in np dimension (P)

Description: Specifies number of complex time-domain data points for LP (linear prediction) in the np dimension by which the original data is to be extended (or altered) in either the forward or backward direction. lpext is constrained by (strtext-lpext)>= ≥0 for lpopt='b' and by (strtext+lpext-1)<=fn/2 for lpopt='f'. In the np direction, if (strtext-lpext)=0 and lpopt='b' (backwards linear prediction with calculation of the first point), fpmult defaults to the theoretical value of 0.5 instead of 1.0. Enter addpar('lp') to create lpext and other np dimension LP parameters in the current experiment.

Related:

addpar	Add selected parameters to the current experiment (M)
lpalg	LP algorithm in np dimension (P)
lpext1	LP data extension in ni dimension (P)
lpext2	LP data extension in ni2 dimension (P)
lpopt	LP algorithm data extension in np dimension (P)
np	Number of data points (P)
strtext	Starting point for LP data extension in np dimension (P)

lpext1 — LP data extension in ni dimension (P)

Description: Specifies number of complex time-domain data points for LP (linear prediction) in the ni dimension by which the original data is to be extended (or altered) in either the forward or backward direction. lpext1 functions analogously to lpext. Enter addpar('lp',1) to create lpext1 and other ni dimension LP parameters in the current experiment.

Related:

addpar	Add selected parameters to the current experiment (M)
lpext	LP data extension in np dimension (P)
ni	Number of increments in 1st indirectly detected dimension (P)

lpext2 — LP data extension in ni2 dimension (P)

Description: Specifies number of complex time-domain data points for LP (linear prediction) in the ni2 dimension by which the original data is to be extended (or altered) in either the forward or backward direction. lpext2 functions analogously to lpext. Enter addpar('lp',2) to create lpext2 and other ni2 dimension LP parameters in the current experiment.

Related:

addpar	Add selected parameters to the current experiment (M)
lpext	LP data extension in np dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)

lpfilt — LP coefficients to calculate in np dimension (P)

Description: Specifies number of complex LP (linear prediction) coefficients in the np dimension to be calculated from a specified region of the time-domain data. lpfilt should be greater than nsignals, where nsignals is the number of sinusoidal signals contained in that FID (or interferogram). Enter addpar('lp') to create lpfilt and other np dimension LP parameters in the current experiment.

Related:

addpar	Add selected parameters to the current experiment (M)
lpalg	LP algorithm in np dimension (P)
lpfilt1	LP coefficients to calculate in ni dimension (P)
lpfilt2	LP coefficients to calculate in ni2 dimension (P)
np	Number of data points (P)

lpfilt1 — LP coefficients to calculate in ni dimension (P)

Description: Specifies number of complex LP (linear prediction) coefficients in the ni dimension to be calculated from a specified region of the time-domain data. lpfilt1 functions analogously to lpfilt. Enter addpar('lp',1) to create lpfilt1 and other ni dimension LP parameters in the current experiment.

Related:

addpar	Add selected parameters to the current experiment (M)
lpfilt	LP coefficients to calculate in np dimension (P)
ni	Number of increments in 1st indirectly detected dimension (P)

lpfilt2 — LP coefficients to calculate in ni2 dimension (P)

Description: Specifies number of complex LP (linear prediction) coefficients in the ni2 dimension to be calculated from a specified region of the time-domain data. lpfilt2 functions analogously to lpfilt. Enter addpar('lp',2) to create lpfilt1 and other ni2 dimension LP parameters in the current experiment.

Related:

addpar	Add selected parameters to the current experiment (M)
lpfilt	LP coefficients to calculate in np dimension (P)
ni	Number of increments in 1st indirectly detected dimension (P)

lpnupts — LP number of data points in np dimension (P)

Description: Specifies number of complex time-domain data points in the np dimension to be used in constructing the autoregressive (lpalg='lparfft') or least-

squares (lpalg='lpnefft') matrix from which the complex LP (linear prediction) coefficients are calculated. Note that lpnupts greater than or equal to 2*lpfilt is required for both algorithms. Enter addpar('lp') to create lpnupts and other np dimension LP parameters in the current experiment.

Related:		
	addpar	Add selected parameters to the current experiment (M)
	lpalg	LP algorithm in np dimension (P)
	lpfilt	LP coefficients to calculate in np dimension (P)
	lpnupts1	LP number of data points in ni dimension (P)
	lpnupts2	LP number of data points in ni2 dimension (P)
	np	Number of data points (P)

lpnupts1 — LP number of data points in ni dimension (P)

Description: Specifies number of complex time-domain data points in the ni dimension to be used in constructing the autoregressive (lpalg1='lparfft') or least-squares (lpalg1='lpnefft') matrix from which the complex LP (linear prediction) coefficients are calculated. lpnupts1 functions analogously to lpnupts. Enter addpar('lp',1) to create lpnupts1 and other ni dimension LP parameters in the current experiment.

Related:		
	addpar	Add selected parameters to the current experiment (M)
	lpalg1	LP algorithm in ni dimension (P)
	lpnupts	LP number of data points in np dimension (P)
	ni	Number of increments in 1st indirectly detected dimension (P)

lpnupts2 — LP number of data points in ni2 dimension (P)

Description: Specifies number of complex time-domain data points in the ni2 dimension to be used in constructing the autoregressive (lpalg2='lparfft') or least-squares (lpalg2='lpnefft') matrix from which the complex LP (linear prediction) coefficients are calculated. lpnupts2 functions analogously to lpnupts. Enter addpar('lp',2) to create lpnupts2 and other ni2 dimension LP parameters in the current experiment.

Related:		
	addpar	Add selected parameters to the current experiment (M)
	lpalg2	LP algorithm in ni2 dimension (P)
	lpnupts	LP number of data points in np dimension (P)
	ni2	Number of increments in 2nd indirectly detected dimension (P)

lpopt — LP algorithm data extension in np dimension (P)

Description: Specifies how the specific LP (linear prediction) algorithm is to extend (or alter) forward or backward the time-domain data in the np dimension. Enter addpar('lp') to create lpopt and other np dimension LP parameters in the current experiment.

Multiple LP operations, extended forward or backward, can be performed on each FID or interferogram. This is accomplished by arraying the LP processing parameters (e.g., lpopt='b','f','b'). The number of LP operations is determined by the LP processing parameter with the largest array size. LP parameters having a smaller array size are padded out with their last value. The most common use for this capability is to back-calculate the first 1 to 2 points in an FID or interferogram and subsequently to extend the length of the time-domain data by LP.

A printout can be obtained for each LP operation on an individually definable FID or interferogram. For example, if lpprint=30,30 and lptrace=1,2, the text file lpanalyz.out.1 contains the LP printout for the first LP operation on FID 1 and lpanalyz.out.2 contains the LP printout for the second LP operation on FID 2.

Values: 'b' indicates the LP coefficients are to be used in the back-calculation of a specified number of time-domain data points.

'f' indicates the LP coefficients are to be used in the forward extension of the time-domain data by a specified number of points. The characteristic polynomial in z space, derived from the complex LP coefficients, is set up and rooted. Any root found to lie outside the unit circle is reflected back into the unit circle. New complex LP coefficients are then calculated from these adjusted complex roots.

Related:

addpar	Add selected parameters to the current experiment (M)
lpalg	LP algorithm in np dimension (P)
lpopt1	LP algorithm data extension for ni dimension (P)
lpopt2	LP algorithm data extension for ni2 dimension (P)
lpprint	LP print output for np dimension (P)
lptrace	LP output spectrum for np dimension (P)
np	Number of data points (P)

lpopt1 LP algorithm data extension in ni dimension (P)

Description: Specifies how the specific LP (linear prediction) algorithm is to extend (or alter) forward or backward the time-domain data in the ni dimension. lpopt1 functions analogously to lpopt. Enter addpar('lp',1) to create lpopt1 and other ni dimension LP parameters in the current experiment.

Related:

addpar	Add selected parameters to the current experiment (M)
lpopt	LP algorithm data extension for np dimension (P)
ni	Number of increments in 1st indirectly detected dimension (P)

lpopt2 LP algorithm data extension in ni2 dimension (P)

Description: Specifies how the specific LP (linear prediction) algorithm is to extend (or alter) forward or backward the time-domain data in the ni2 dimension. lpopt2 functions analogously to lpopt. Enter addpar('lp',2) to create lpopt2 and other ni2 dimension LP parameters in the current experiment.

Related:

addpar	Add selected parameters to the current experiment (M)
lpopt	LP algorithm data extension for np dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)

lpprint LP print output for np dimension (P)

Description: Controls LP (linear prediction) print output for the np dimension and creates an output file in the current experiment directory (curexp) with the name lpanalyz.out.1. Enter addpar('lp') to create lpprint and other np dimension LP parameters in the current experiment.

Values: Comprised of sum of decimal values of the following bit fields, in which each bit field controls an independent output option:

- Bit 0 (decimal value 1) writes out the LP matrix and Y vector from which the LP coefficients are calculated.

- Bit 1 (decimal value 2) writes out the LP coefficients that have been obtained using either of the two supported algorithms.
- Bit 2 (decimal value 4) writes out the LP roots obtained from the characteristic polynomial derived from the LP coefficients; this only applies for lpalg='lpfft' and lpopt='f'.
- Bit 3 (decimal value 8) writes out the original and recalculated values for each LP extended (or altered) complex time-domain data point.
- Bit 4 (decimal value 16) writes out the internal LP parameter structure.

For example, lpprint=12 and lptrace=1 yields the following information in the file curexp/lpanalyz.out.1 for spectrum 1 along f_2: the values for all lpfilt complex LP coefficients and the original and recalculated values for each of the lpext LP extended (or altered) complex time-domain data points.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
curexp	Current experiment directory (P)
lpalg	LP algorithm in np dimension (P)
lpext	LP data extension in np dimension (P)
lpfilt	LP coefficients to calculate in np dimension (P)
lpopt	LP algorithm data extension for np dimension (P)
lpprint1	LP print output for ni dimension (P)
lpprint2	LP print output for ni2 dimension (P)
lptrace	LP output spectrum in np dimension (P)
np	Number of data points (P)

lpprint1 LP print output for ni dimension (P)

Description: Controls LP (linear prediction) print output for the ni dimension and creates an output file in the current experiment directory (curexp) with the name lpanalyz1.out.1. lpprint1 functions analogously to lpprint. Enter addpar('lp',1) to create lpprint1 and other ni dimension LP parameters in the current experiment.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
lpprint	LP print output for np dimension (P)
ni	Number of increments in 1st indirectly detected dimension (P)

lpprint2 LP print output for ni2 dimension (P)

Description: Controls LP (linear prediction) print output for the ni2 dimension and creates an output file in the current experiment directory (curexp) with the name lpanalyz2.out.1. lpprint2 functions analogously to lpprint. Enter addpar('lp',2) to create lpprint2 and other ni2 dimension LP parameters in the current experiment.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
lpprint	LP print output for np dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)

lptrace — LP output spectrum in np dimension (P)

Description: Specifies for which spectrum LP (linear prediction) output in the np dimension is produced in accordance with the parameter lpprint. Enter addpar('lp') to create lptrace and other np dimension LP parameters in the current experiment.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
lpalg	LP algorithm in np dimension (P)
lpprint	LP print output in np dimension (P)
lptrace1	LP output spectrum in ni dimension (P)
lptrace2	LP output spectrum in ni2 dimension (P)
np	Number of data points (P)

lptrace1 — LP output spectrum in ni dimension (P)

Description: Specifies for which spectrum or trace LP (linear prediction) output in the ni dimension is produced in accordance with the parameter lpprint1. lptrace1 functions analogously to lptrace. Enter addpar('lp',1) to create t lpprint2 and other ni dimension LP parameters in the current experiment.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
lpprint1	LP print output in ni dimension (P)
lptrace	LP output spectrum in np dimension (P)
ni	Number of increments in 1st indirectly detected dimension (P)

lptrace2 — LP output spectrum in ni2 dimension (P)

Description: Specifies for which spectrum or trace LP (linear prediction) output in the ni2 dimension is produced in accordance with the parameter lpprint2. lptrace2 functions analogously to lptrace. Enter addpar('lp',2) to create lptrace2 and other ni2 dimension LP parameters in the current experiment.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
lpprint2	LP print output in ni2 dimension (P)
lptrace	LP output spectrum in np dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)

ls — List files in directory (C)

Syntax: ls<(directory)>

Description: Lists the names of files in a directory on the text output window. ls is identical to dir and lf.

Arguments: directory is the name of a directory. The default is the current working directory. ls is equivalent to the UNIX command ls and uses the same options (e.g., –l for a long listing such as ls('-l *.fid')).

Examples:

```
ls
ls('data')
ls('-l *.fid')
```

Related:		
	dir	List files in directory (C)
	lf	List files in directory (C)

lsfid — Number of complex points to left-shift the np FID (P)

Description: Specifies number of complex points (not real points) that the np FID is to be either left-shifted (lsfid>0) or right-shifted (lsfid<0). A right shift adds zeros to the front of the FID. lsfid (and related parameters phfid and lsfrq) operate on complex np FID data, referred to as the t_2 dimension in a 2D experiment or as the t_3 dimension in a 3D experiment. lsfid is in the processing group and is properly handled by a wti operation (display).

Values: -fn/2 to np/2 (or -fn/2 to fn/2 if fn<np), 'n'

Related:		
	dfid	Display a single FID (C)
	ds	Display a spectrum FID (C)
	fn	Fourier number in directly detected dimension (P)
	ft	Fourier transform 1D data (C)
	ft1d	Fourier transform along f_2 dimension (C)
	ft2d	Fourier transform 2D data (C)
	lsfid1	Number of complex points to left-shift ni interferogram(P)
	lsfid2	Number of complex points to left-shift ni2 interferogram (P)
	lsfrq	Frequency shift of the fn spectrum in Hz (P)
	np	Number of data points (P)
	phfid	Zero-order phasing constant for the np FID (P)
	wft	Weight and Fourier transform 1D data (C)
	wft1d	Weight and Fourier transform f_2 of 2D data (C)
	wft2d	Weight and Fourier transform 2D data (C)
	wti	Interactive weighting (C)

lsfid1 — Number of complex points to left-shift ni interferogram (P)

Description: Specifies number of hypercomplex (for hypercomplex interferogram data) or complex (for complex interferogram data) points that the ni interferogram is to be either left-shifted (lsfid1>0) or right-shifted (lsfid1<0). A right shift adds zeros to the front of the FID. lsfid1 (and related parameters phfid1 and lsfrq1) operate on ni interferogram data, both hypercomplex and complex. ni interferogram data are referred to as the t_1 dimension in both a 2D and a 3D experiment. lsfid1 is in the processing group and is properly handled by a wti operation (display); that is, a wti operation on an ni interferogram applies the parameters phfid1, lsfid1, and lsfrq1, if selected, to the time-domain data prior to the Fourier transformation.

Values: -fn1/2 to ni (or -fn1/2 to fn1/2 if fn1<2*ni), 'n'

Related:		
	fn1	Fourier number in 1st indirectly detected dimension (P)
	lsfid	Number of complex points to left-shift np FID (P)
	lsfid2	Number of complex points to left-shift ni2 interferogram (P)
	lsfrq1	Frequency shift of the fn1 spectrum in Hz (P)
	ni	Number of increments in 1st indirectly detected dimension (P)
	phfid1	Zero-order phasing constant for ni interferogram (P)
	wti	Interactive weighting (C)

lsfid2 — Number of complex points to left-shift ni2 interferogram (P)

Description: Specifies the number of hypercomplex (for hypercomplex interferogram data) or complex (for complex interferogram data) points that the ni2 interferogram is to be either left-shifted (lsfid2>0) or right-shifted (lsfid2<0). A right shift adds zeros to the front of the FID. lsfid2 (and related parameters phfid2 and lsfrq2) operate on ni2 interferogram data, both hypercomplex and complex. ni2 interferogram data are referred to as the t_2 dimension in a 3D experiment. lsfid2 is in the processing group and is properly handled by a wti operation (display).

Values: −fn2/2 to ni2 (or −fn2/2 to fn2/2 if fn2<2*ni2), 'n'

Related:

fn2	Fourier number in 2nd indirectly detected dimension (P)
lsfid	Number of complex points to left-shift np FID (P)
lsfid1	Number of complex points to left-shift ni interferogram(P)
lsfrq2	Frequency shift of the fn2 spectrum in Hz (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
phfid2	Zero-order phasing constant for ni2 interferogram (P)
wti	Interactive weighting (C)

lsfrq — Frequency shift of the fn spectrum (P)

Description: Sets a frequency shift of spectral data, in Hz. lsfrq is the time-domain equivalent of lp within VnmrJ. lsfrq (and related parameters phfid and lsfid) operate on complex np FID data, referred to as the t_2 dimension in a 2D experiment or as the t_3 dimension in a 3D experiment. lsfrq is in the processing group and is properly handled by a wti operation (display).

Values: A positive value results in peaks being shifted downfield (to the left).
A negative value results in peaks being shifted upfield (to the right).

Related:

dfid	Display a single FID (C)
ds	Display a spectrum FID (C)
fn	Fourier number in directly detected dimension (P)
ft	Fourier transform 1D data (C)
ft1d	Fourier transform along f_2 dimension (C)
ft2d	Fourier transform 2D data (C)
lp	First-order phase in directly detected dimension (P)
lsfid	Number of complex points to left-shift np FID (P)
lsfrq1	Frequency shift of the fn1 spectrum in Hz (P)
lsfrq2	Frequency shift of the fn2 spectrum in Hz (P)
phfid	Zero-order phasing constant for np FID (P)
wft	Weight and Fourier transform 1D data (C)
wft1d	Weight and Fourier transform f_2 of 2D data (C)
wft2d	Weight and Fourier transform 2D data (C)
wti	Interactive weighting (C)

lsfrq1 — Frequency shift of the fn1 spectrum (P)

Description: Sets a frequency shift of spectral data, in Hz. lsfrq1 is the time-domain equivalent of lp1 within VnmrJ. lsfrq1 (and related parameters phfid1 and lsfid1) operate on ni interferogram data, both hypercomplex and complex. ni interferogram data are referred to as the t_1 dimension in both a 2D and a 3D experiment. lsfrq1 is in the processing group and is properly handled by a wti operation (display); that is, a wti operation on an ni

interferogram applies the parameters phfid1, lsfid1, and lsfrq1, if selected, to the time-domain data prior to the Fourier transformation.

Values: A positive value results in peaks being shifted downfield (to the left). A negative value results in peaks being shifted upfield (to the right).

Related:		
	fn1	Fourier number in 1st indirectly detected dimension (P)
	lp1	First-order phase in 1st indirectly detected dimension (P)
	lsfid1	Number of complex points to left-shift ni interferogram(P)
	lsfrq	Frequency shift of the fn spectrum in Hz (P)
	lsfrq2	Frequency shift of the fn2 spectrum in Hz (P)
	ni	Number of increments in 1st indirectly detected dimension (P)
	phfid1	Zero-order phasing constant for ni interferogram (P)
	wti	Interactive weighting (C)

lsfrq2 Frequency shift of the fn2 spectrum (P)

Description: Sets a frequency shift of spectral data in Hz. lsfrq2 is the time-domain equivalent of lp2 within VnmrJ. lsfrq2 (and related parameters phfid2 and lsfid2) operate on ni2 interferogram data, both hypercomplex and complex. ni2 interferogram data is referred to as the t_2 dimension in a 3D experiment. lsfrq2 is in the processing group and is properly handled by a wti operation (display).

Values: A positive value results in peaks being shifted downfield (to the left). A negative value results in peaks being shifted upfield (to the right).

Related:		
	fn2	Fourier number in 2nd indirectly detected dimension (P)
	lp2	First-order phase in 2nd indirectly detected dimension (P)
	lsfid1	Number of complex points to left-shift ni interferogram (P)
	lsfid2	Number of complex points to left-shift ni2 interferogram (P)
	lsfrq	Frequency shift of the fn spectrum in Hz (P)
	ni2	Number of increments in 2nd indirectly detected dimension (P)
	phfid2	Zero-order phasing constant for ni2 interferogram (P)
	wti	Interactive weighting (C)

lvl Zero-order baseline correction (P)

Description: When spectral display is active, the command dc turns on a linear drift correction (baseline correction). The result of this operation includes calculating a zero-order baseline correction parameter lvl. This is done by averaging of a small number of points at either end of the display and drawing a straight line baseline between them.

Related:		
	cdc	Cancel drift correction (C)
	lvltlt	Control sensitivity of lvl and tlt adjustments (P)
	tlt	First-order baseline correction (P)

lvltlt Control sensitivity of lvl and tlt adjustments (P)

Description: Controls the sensitivity of the interactive lvl and tlt adjustments. lvltlt is in the "current" parameter set and is basically a multiplier for the sensitivity. If this parameter does not exist, it can be created by commands create('lvltlt') setgroup('lvltlt','display').

Values: The default value is 1.0. Larger values make the adjustments larger. Smaller values make the adjustments smaller.

Related:	`create`	Create new parameter in a parameter tree (C)
	`ds`	Display a spectrum (C)
	`lvl`	Zero-order baseline correction (P)

L

M

macro	Macro name (P)
macrocat	Display a user macro file in text window (C)
macrocp	Copy a user macro file (C)
macrodir	List user macro files (C)
macroedit	Edit a macro with user-selectable editor (M)
macrold	Load a macro into memory (C)
macrorm	Remove a user macro (C)
macrosyscat	Display a system macro file in text window (C)
macrosyscp	Copy a system macro to become a user macro (C)
macrosysdir	List system macros (C)
macrosysrm	Remove a system macro (C)
macrovi	Edit a user macro with the vi text editor (M)
make3dcoef	Make a 3D coefficients file from 2D coefficients (M)
makedosyparams	Create parameters for DOSY processing (M)
makefid	Make a FID element using numeric text input (C)
makeeccglobals	Create global parameters for ECC control (M)
makeslice	Synthesize 2D projection of 3D DOSY experiment (C)
man	Display online description of command or macro (M)
managedb	Update user files (U)
manualpath	Path to user's manual directory (P)
manvi	Edit online description of a command or macro (M)
mapwin	List of experiment numbers (P)
mark	Determine intensity of spectrum at a point (C)
masvt	Type of variable temperature system (P)
maxattench1-4	Maximum limit for attenuator setting for rf channel 1-4 (P)
maxpen	Maximum number of pens to use (P)
md	Move display parameters between experiments (C)
menu	Change status of menu system (C)
menuvi	Edit a menu with vi text editor (M)
method	Autoshim method (P)
mf	Move FIDs between experiments (C)
mfblk	Copy FID block (C)
mfclose	Close memory map FID (C)
mfdata	Move FID data (C)
mfopen	Memory map open FID file (C)
mftrace	Move FID trace (C)
minsw	Reduce spectral width to minimum required (M)
mkdir	Create new directory (C)
mlabel	Menu label (P)
move	Move to an absolute location to start a line (C)
movedssw	Set down sampling parameters for selected spectral region (M)
moveossw	Set over sampling parameters for selected spectral region (M)
movesw	Move spectral window according to cursors (M)

M

movetof	Move transmitter offset (M)
mp	Move parameters between experiments (C)
mqcosy	Set up parameters for MQCOSY pulse sequence (M)
mrev8	Set up parameters for MREV8 pulse sequence (M)
mrfb	Set the filter bandwidths for multiple receivers (P)
mref	Set referencing based on a existing spectrum of the sample (M)
mrgain	Set the gain for multiple receivers (P)
mstat	Display memory usage statistics (C)
mstring	Menu string (P)
mtune	Tune probe using swept-tune graphical display (M)
mv	Move and/or rename a file (C)
mxconst	Maximum scaling constant (P)

macro — Macro name (P)

Description: A string parameter, available in each experiment, similar to the n1, n2, and n3 parameters. Certain macros, such as h1p, need to know which macro invoked them. This parameter is used to pass that information.

See also: *User Programming*

Related:

h1p	Process simple proton spectra from h1 macro (M)
n1,n2,n3	Name storage for macros (P)

macrocat — Display a user macro file in text window (C)

Syntax: `macrocat(file1<,file2><,...>)`

Description: Displays one or more user macro files in the text window.

Arguments: `file1, file2, ...` are the names of macros in the user macro library.

Examples:
```
macrocat('build')
macrocat('dan','george')
```

See also: *User Programming*

Related:

macrodir	List user macros (C)
macrosyscat	Display a system macro file in text window (C)

macrocp — Copy a user macro file (C)

Syntax: `macrocp(from_file,to_file)`

Description: Makes a copy of the existing user macro file and places the copy in the user's macro library. Using macrocp to make a backup copy is the recommended procedure to modify a macro but still be able to revert to the previous version if you are unsure about the modification. macrocp can also be useful for writing a new macro that is very similar to an existing macro.

Arguments: from_file is the name of an existing user macro file to be copied. The file must be in the user's macro library.

to_file is the file name to be given to the copy. This name must be different from the name of the original macro.

Examples: `macrocp('dan','dan.old')`

See also: *User Programming*

Related:

macrocat	Display a user macro file in text window (C)
macrodir	List user macros (C)
macrosyscp	Copy a system macro to become a user macro (C)

macrodir — List user macro files (C)

Description: Lists the names of user macro files in the user's macro library.

See also: *User Programming*

Related:

macrosysdir	Lists system macros (C)

macroedit — Edit a macro with user-selectable editor (M)

Syntax: `macroedit(file)`

Description: Opens a MAGICAL macro file from a user's personal macro library for editing (if you want to edit a system macro, copy it to a personal library and then use `macroedit`).

The default editor is `vi`. To select another editor, first set UNIX environmental variable `vnmreditor` to the name of the editor; that is, in the `.login` file, change the line

```
setenv vnmreditor old_ed
```

to become

`setenv vnmreditor new_ed` (e.g., `setenv vnmreditor emacs`).

Second, make sure a script with the prefix `vnmr_` followed by the name of the editor is placed in the `bin` subdirectory of the VnmrJ system directory (e.g., `vnmr_emacs`).

The script file makes adjustments for the type of graphic interface in use. Scripts provided in the software include *v*`nmr_vi` and `vnmr_textedit`. To create other scripts, refer to the `vnmr_vi` script for non-window editor interfaces or refer to `vnmr_textedit` for window-based editor interfaces.

Arguments: `file` is the name of the macro file you wish to edit.

Examples:

```
macroedit('pa')
```

See also: *User Programming*

Related:

paramedit	Edit a parameter and its attributes with user-selected editor (C)
paramvi	Edit a parameter and its attributes with *vi* editor (M)
edit	Edit a file with user-selectable editor (C)
macrovi	Edit a user macro with `vi` editor (M)
menuvi	Edit a menu with the `vi` editor (M)
textvi	Edit text file of current experiment with *vi* editor (M)

macrold — Load a macro into memory (C)

Syntax: `macrold(file)<:dummy>`

Description: Loads a macro, user or system, into memory. If the macro already exists in memory, it is overwritten by the new macro. Loading a macro into memory increases the execution speed of the macro. The trade-off is that the macro uses memory. The `mstat` command displays macros that have been loaded into memory. One or more individual macros, or all the macros loaded in memory, can be removed from memory with the `purge` command.

If a macro already loaded into memory is edited using `macrovi` or `macroedit`, the changed macro automatically is loaded by those macros. This

overwrites the previous macro. However, if a macro is edited or created some other way (with macrocp perhaps), the changed version is not automatically loaded. If the macro already exists in memory, the previous version executes unless the user runs macrold.

Arguments: file is the name of the macro file to be loaded into memory. For loading macros, the same search path is used as when deciding which macro to execute. That is, the user's private maclib directory is searched first and finally the system maclib. If an absolute path is supplied as the file argument, that macro is loaded. This allows macros not in a maclib to be loaded and executed from VnmrJ.

dummy is any throwaway variable. Requesting a return value suppresses the message in the status window (line 3) that the macro is loaded.

Examples:
```
macrold('pa')
macrold('_sw'):$noline3
```

See also: *User Programming*

Related:

macrocp	Copy a user macro file (C)
macroedit	Edit a macro with user-selectable editor (M)
macrovi	Edit a user macro with the vi text editor (M)
mstat	Display memory usage statistics (C)
purge	Remove macros from memory (C)

macrorm — Remove a user macro (C)

Syntax: `macrorm(file)`

Description: Removes a user macro from the user's macro directory. If the macro has already been loaded in memory, it remains in memory until a new macro of the same name is loaded or the program exits.

Arguments: file is the name of the user macro to be removed.

Examples:
```
macrorm('pa')
```

See also: *User Programming*

Related:

delcom	Delete a user macro (M)
macrodir	List user macros (C)
macrosysrm	Remove a system macro (C)
purge	Remove all macros from memory (C)

macrosyscat — Display a system macro file in text window (C)

Syntax: `macrosyscat(file1<,file2><,...>)`

Description: Displays one or more system macro files in the text window.

Arguments: file1, file2, ... are names of macros in the system macro library.

Examples:
```
macrosyscat('build')
macrosyscat('dan','george')
```

See also: *User Programming*

Related:

macrocat	Display a user macro file in text window (C)
macrosysdir	Lists system macros (C)

macrosyscp — Copy a system macro to become a user macro (C)

Syntax: `macrosyscp(from_file,to_file)`

Description: Makes a copy of the existing system macro file and places the copy in the user's macro library. This is the recommended way to modify a system macro for personal use.

Arguments: `from_file` is the name of an existing system macro file to be copied. The file must be in the system macro library.

`to_file` is the file name to be given to the copy. In this case, the name of the copied macro can be the same as the original macro. In many cases, it is the same, allowing the user to have a personal macro of the same name as the system macro but which will override the system macro.

Examples:
```
macrosyscp('pa','pa')
macrosyscp('pa','mypa')
```

See also: *User Programming*

Related:

`macrocp`	Copy a user macro file (C)
`macrosyscat`	Display a system macro file in text window (C)
`macrosysdir`	Lists system macros (C)

macrosysdir — List system macros (C)

Description: Lists the names of system macros in the system macro library.

See also: *User Programming*

Related:

`macrodir`	List user macros (C)

macrosysrm — Remove a system macro (C)

Syntax: `macrosysrm(file)`

Description: Removes a system macro file from the system macro directory. If the macro has already been loaded in memory, it remains in memory until a new macro of the same name is loaded or the program exits.

Arguments: `file` is the name of the system macro file to be removed.

Examples:
```
macrosysrm('pa')
```

See also: *User Programming*

Related:

`macrorm`	Remove a user macro (C)
`macrosysdir`	Lists system macros (C)
`purge`	Remove all macros from memory (C)

macrovi — Edit a user macro with the vi text editor (M)

Syntax: `macrovi(file)`

Description: Initiates creating a new user macro or modifying an existing user macro using the UNIX `vi` text editor. On the Sun workstation, a pop-up window contains the edit. On the GraphOn, the edit is done on the entire terminal. To edit a system macro, first copy the macro to a personal library and then edit it using `macroedit` or `macrovi`.

Arguments: `file` is the name of an existing user's macro to be edited or the name of a new user's macro to be created.

Examples:
```
macrovi('pa')
```

See also: *User Programming*

Related:

`macroedit`	Edit a macro with a user-selectable editor (C)
`vi`	Edit text file with *vi* text editor (C)

make3dcoef — Make a 3D coefficients file from 2D coefficients (M)

Syntax: `make3dcoef<('t1t2'|'t2t1')>`

Description: Makes a 3D coefficients file from 2D coefficients and writes the file in the path stored by `curexp`. 2D coefficients are supplied as strings in the parameters `f2coef` and `f1coef`. This macro is capable of handling 3D data collected with any number of data sets (e.g., TPPI, Hypercomplex, Rance SE, Kay SE, and phase-sensitive gradient in one or both dimensions). `make3dcoef` is called by the `ft3d` macro.

The 2D coefficients are supplied as strings in `f1coef` and `f2coef`. These coefficients are the same as found by processing with `wft2d(2dcoefs)`. Note that `wft2da` (for States-Hypercomplex method) is equivalent to `wft2d(1,0,0,0,0,0,-1,0)`, and that `wft2d` (for absolute-value mode) is equivalent to `wft2d(1,0,0,-1)`.

Coefficients are separated by spaces and not commas. For example, if a 3D data set collected by the States-Hypercomplex method in both `ni` and `ni2` dimensions, `f1coef='1 0 0 0 0 0 -1 0'` and `f2coef='1 0 0 0 0 0 -1 0'`. And if a 3D data set collected in absolute-value mode in both `ni` and `ni2` dimensions, `f1coef='1 0 0 -1'` and `f2coef='1 0 0 -1'`.

The `f1coef` and `f2coef` parameters are created by the `par3d` macro. Execution of `make3dcoef` when `f1coef` and `f2coef` have no value or inconsistent values causes the macro to abort, which enables the user to enter these values and reexecute the macro. For example, the value of `f1coef` when the F1 dimension can be processed with `wft2da` is `'1 0 0 0 0 0 -1 0'`. The value of `f2coef` when the F2 dimension can be processed with `wft2d(1,0,1,0,0,-1,0,1)` is `'1 0 1 0 0 -1 0 1'`.

The parameters `f1coef` and `f2coef` must be 2D coefficients that give proper `ni` and `ni2` first planes with the same `rp` (assuming `lp` is 0 by using `calfa`) values. For example, processing the phase-sensitive gradient dimension should not be done with `1 0 0 1 0 1 1 0` and applying 45° phase shifts to `rp`, but with `1 0 1 0 0 1 0 -1`, or its variant, that gives the same `rp` value as the other dimension. This also applies to Rance-type or Kay-type sensitivity-enhanced dimensions.

Note that sensitivity-enhanced sequences (gradient or otherwise) can be processed two different ways to give “orthogonal” data sets. The coefficients must be picked so that they have the same `rp` as the other dimension.

This macro can also handle coefficients that are not 1s or 0s. For example, if processing requires that a data set contributes to the interferogram after a 30°phase shift, cos(30) and sin(30) can be selected as the real and imaginary contributions, respectively, during the construction of the interferogram.

Arguments: `'t1t2'` means `array='phase,phase2'` in simple hypercomplex data sets. It means `array='t1related','t2related'` with multiple sets in general.

`'t2t1'` means `array='phase2,phase'` in simple hypercomplex data sets. It means `array='t2related','t1related'` with multiple sets in general.

If no argument is used and if `array='phase,phase2'` or `array='phase2,phase`, the macro automatically decides on `'t1t2'` or `'t2t1'`, respectively.

See also: *NMR Spectroscopy User Guide*

Related:

`array`	Parameter order and precedence (P)
`calfa`	Recalculate alfa so that first-order phase is zero (M)
`curexp`	Current experiment directory (P)
`f1coef`	Coefficient to construct F1 interferogram (P)
`f2coef`	Coefficient to construct F2 interferogram (P)

ft3d	Perform a 3D Fourier transform on a 3D FID data set (M)
lp	First-order phase in directly detected dimension (P)
ni	Number of increments in 1st indirectly detected dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
ntype3d	Specify whether f_1 or f_2 display expected to be N-type (P)
rp	Zero-order phase in directly detected dimension (P)
wft2d	Weight and Fourier transform 2D data (C)
wft2da	Weight and Fourier transform phase-sensitive data (M)

makedosyparams Create parameters for DOSY processing (M)

Syntax: `makedosyparams(dosytimecubed,dosyfrq)`

Description: This macro is automatically called by the Dbppste, DgcsteSL, Doneshot, Dbppsteinept, Dgcstecosy, and Dgcstehmqc sequences to create the parameters dosyfrq, dosygamma, and dosytimecubed, which are necessary for the dosy analysis. Do not manually run makedosyparams.

See also: *NMR Spectroscopy User Guide*

Related:

dosy	Process DOSY experiments (M)
dosyfrq	Larmor frequency of phase encoded nucleus in DOSY (P)
dosygamma	Gyromagnetic constant of phase encoded nucleus in DOSY (P)
dosytimecubed	Gyromagnetic constant of phase encoded nucleus in DOSY (P)

makefid Make a FID element using numeric text input (C)

Syntax: `makefid(file<,element_number<,format>)`

Description: Creates FID files that can be used to introduce computed data into an experiment. The number of points comes from the number of numeric values read from the input file. If the current experiment already contains a FID, you will not be able to change either the format or the number of points from that present in the FID file. Use `rm(curexp+'/acqfil/fid')` to remove the FID.

The makefid command does not look at parameter values when establishing the format of the data or the number of points in an element. Thus, if the FID file is not present, it is possible for makefid to write a FID file with a header that does not match the value of dp or np. Because the active value is in the processed tree, you need to use the setvalue command if any changes are required.

Arguments: file is the name of the input file. It contains numeric values, two per line. The first value is assigned to the X (or real) channel; the second value on the line is assigned to the Y (or imaginary) channel.

element_number is the number of the element or FID and is any integer larger than 0. The default is the first element or FID. If the FID element already exists in the FID file, the program overwrites the old data.

format is a character string with the precision of the resulting FID file and can be specified by one of the following strings:

'dp=n'	single-precision (16-bit) data
'dp=y'	double-precision (32-bit) data
'16-bit'	single-precision (16-bit) data
'32-bit'	double-precision (32-bit) data

If an FID file exists, makefid uses the same format string for precision; otherwise, the default is double-precision (32-bit) data.

`element_number` and `format` arguments can be entered in any order.

Examples: `makfid('fid.in',2,'32-bit')`

See also: *NMR Spectroscopy User Guide*; *User Programming*

Related:

`cp`	Copy a file (C)
`curexp`	Current experiment directory
`dp`	Double precision (P)
`mv`	Move and/or rename a file (C)
`np`	Number of data points (P)
`rm`	Delete file (C)
`setvalue`	Set value of any parameter in a tree (C)
`writefid`	Write numeric text file using a FID element (C)

`makeeccglobals` Create global parameters for ECC control (M)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Creates the following nine global parameters required for ECC control by PSG: `tc1z`, `tc2z`, `tc3z`, `tc4z`, `amp1z`, `amp2z`, `amp3z`, `amp4z`, and `chiliConf`

Related: `chiliConf`

`makeslice` Synthesize 2D projection of 3D DOSY experiment (C)

Syntax: `makeslice(<option>,lowerlimit,upperlimit)`

Arguments: `option` is either `'i'` or `'s'`.

`'i'` includes the "tails" of diffusion peaks that lie outside the range between `lowerlimit` and `upperlimit`. The default is `'i'`.

`'s'` only includes the integration peaks whose diffusion coefficient lies between the specified limits.

`lowerlimit` is the lower diffusion limit (in units of 10^{-10} m^2/s) to be displayed.

`upperlimit` is the upper diffusion limit (in units of 10^{-10} m^2/s) to be displayed.

Description: Synthesizes an integral projection between specified diffusion limits of a 3D DOSY spectrum onto the frequency-frequency plane. `makeslice` requires the first 2D increment of the 3D DOSY data to have been transformed.

See also: *NMR Spectroscopy User Guide*

Related:

`dosy`	Process DOSY experiments (M)
`showoriginal`	Restore first 2D spectrum in 3D DOSY spectrum (M)

`man` Display online description of command or macro (M)

Syntax: `man('file')<:$return>`

Displays a description of commands and macros from files in the applications directory. The manual file is displayed in the text window when it is retrieved by the `man` macro. The man macro aborts if a name is not supplied as an argument.

Arguments: `file` — name of a command or macro in one of the applications directories.

`:$res` — supply a return argument to suppress messages if the manual page does not exist.

Examples: `man('mark')`

```
man('notAcommand'):$res
```

See also: *NMR Spectroscopy User Guide; User Programming*

Related:

`manvi`	Edit online description of a command or macro (M)
`manualpath`	Path to user's manual directory (P)

`managedb` Update user files (U)

Syntax: `managedb update`

Description: Updates VnmrJ database for the Locator.

See also: *NMR Spectroscopy User Guide*

`manualpath` Path to user's manual directory (P)

Description: Contains the absolute path to a user's directory of VnmrJ manual entries. If `manualpath` exists for a user, it must be defined in the user's global parameter file. Enter `create('manualpath','string','global')` to create the `manualpath` parameter.

See also: *User Programming*

Related:

`man`	Display online description of a command or macro (M)

`manvi` Edit online description of a command or macro (M)

Syntax: `manvi('file')`

Description: Enables editing or creating an online description of commands and macros stored in any of the applications directories for to which the user has write permission.

Arguments: `file` is the name of a command macro.

Examples: `manvi('mark')`

See also: *User Programming*

Related:

`man`	Display online description of command or macro (M)

`mapwin` List of experiment numbers (P)

Description: Arrayed global parameter that maintains a list of experiment numbers for the window panes in the VnmrJ graphics window.

Related:

`curwin`	Current window (P)
`fontselect`	Open FontSelect window (C)
`jwin`	Activate current window (M)
`setgrid`	Activate selected window (M)
`setwin`	Activate selected window (C)

`mark` Determine intensity of spectrum at a point (C)

Syntax:

(1) `mark<(f1_position)><:intensity>`

(2) `mark<(left_edge,region_width)><:intensity, integral>`

(3) `mark<(f1_position,f2_position)><:intensity>`

(4) `mark<(f1_start,f1_end,f2_start,f2_end)> <:intensity,integral,c1,c2>`

(5) `mark<('trace',<options>)><:intensity,integral, c1,c2>`

(6) `mark('reset')`

Description: Find the intensity of a spectrum at a point. Either 1D or 2D operations can be performed in the cursor or box mode for a total of four separate functions: 1D operations in cursor mode (syntax 1), 1D operations in box mode (syntax 2), 2D operations in cursor mode (syntax 3) and 2D operations in box mode (syntax 4).

In the *cursor mode*, the intensity at a particular point is found. In the *box mode*, the integral over a region is calculated. The displayed integral is scaled in the same way as output from `dli` is scaled; that is, by the `ins` and `insref` parameters. For 2D operations, this is the volume integral and the volume is scaled by `ins2` and `ins2ref`. In addition, the `mark` command in the box mode finds the maximum intensity and the coordinate(s) of the maximum intensity.

The `mark` command requires that transformed data be present in the current experiment. If required, it recomputes the phase file from the complex data (i.e., it rephases the data if required); however, the `mark` command requires parameters from the command line if no data is displayed (i.e., if `ds` or `dconi` has not been executed).

Note that 2D operations require that 2D data be present. This not only means that `ni` must be larger than 1, but also that the data was transformed using `ft1d`, `ft2d` or an equivalent (and not `ft` or its equivalents).

The `mark` command, as well as the MARK button of `ds`, writes output to a file in the current experiment. For 1D operations, the file is named `mark1d.out`; for 2D operations, it is `mark2d.out`. If this file already exits, VnmrJ appends output from the current `mark` operation to the end of the file. (Older versions of VnmrJ used `ds.out` and `dconi.out` as files for output from the MARK button). Either file can be read by other programs at any time between operations.

The following criteria establish the exact function. The command checks them in the following order until it determines the exact function:

1. Number of numeric parameters.

2. Number of return values called out.

3. Which display command (`ds` or `dconi`) was last used.

4. Nature of the data in the experiment.

The first two criteria only serve to distinguish between box mode and cursor mode. The nature of the data in the experiment and the last display command entered determines whether a 1D or a 2D operation is selected.

Arguments: `f1_position` defines the position, in Hz, along the f_1 axis in the 1D and 2D cursor modes. The default is `cr` (1D) or `cr1` (2D).

`left_edge` defines the position of the left edge of the region, in Hz, to be integrated in 1D box mode. The default is `cr`.

`region_width` defines the width, in Hz, of the region, which extends to the right of `left_edge`, in 1D box mode. The default is `delta`.

`f2_position` defines the position, in Hz, along the f_2 axis in the 2D cursor mode. The default is `delta1`.

`f1_start` and `f1_end` define region along the f_1 axis in the 2D box mode.

`f2_start` and `f2_end` define region along the f_2 axis in the 2D box mode.

`'trace'` is a keyword to select a 1D operation if 2D data is present. It must be either the first or the last argument (e.g., `mark('trace',400)` determines the intensity at 400 Hz in the current trace).

'reset' is a keyword to erase the output files from the mark command. No other argument can be used with this keyword. Use rename to rename the current mark output files (e.g., rename(curexp+'/mark1d.out', curexp+'/mark.16.01.89')

intensity is a return value set to the intensity of the spectrum at the point for either 1D or 2D operations (the maximum if cursor mode was selected).

integral is a return value set to the integral of the spectrum at the point. integral is not returned in the cursor mode.

c1,c2 are return values set to the coordinates where the maximum intensity was found in 2D mode. c1 and c2 are not returned in the cursor mode.

Examples: 1D data sets:

mark(cr)	cursor mode for 1D data
mark(cr,delta)	box mode for 1D data

2D data sets (2D mode): In this mode, the order of the arguments to mark is independent of the trace parameter.

mark(cr1,cr)	cursor mode for 2D data
mark(cr1,delta1,cr,delta)	box mode for 2D data

2D data sets (1D mode): In this mode, the selection of the arguments to mark is dependent on the trace parameter. If trace='f2', then cr, delta, sp, or wp are appropriate. If trace='f1', then cr1, delta1, sp1, and wp1 are appropriate.

mark('trace',cr)	cursor mode for selected 2D trace
mark('trace',cr1,delta1)	box mode for selected 2D trace

Alternate: MARK button in the ds program.

See also: *NMR Spectroscopy User Guide; User Programming*

Related:

cr	Cursor position in directly detected dimension (P)
cr1	Cursor position in 1st indirectly detected dimension (P)
curexp	Current experiment directory (P)
dconi	Interactive 2D contour display (C)
delta	Difference of two frequency cursors (P)
dli	Display list of integrals (C)
ds	Display a spectrum (C)
ft1d	Fourier transform along f_2 dimension (C)
ft2d	Fourier transform 2D data (C)
ins	Integral normalization scale (P)
ins2	2D volume value (P)
insref	Fourier number scaled value of an integral (P)
ins2ref	Fourier number scaled volume of a peak (P)
mv	Move and/or rename a file (C)
ni	Number of increments in 1st indirectly detected dimension (P)

masvt — Type of variable temperature system (P)

Description: Identifies the type of VT system in use: the standard Oxford VT controller or the Oxford-Sorenson or solids VT controller system (used with the Varian VT CP/MAS probe). masvt is a global parameter that is active on all of each user's experiments on a per user account basis. The current value of the parameter can be displayed by typing masvt?.

Note that the VT Controller option displayed by config must be set to Present for either VT controller system to be active. If masvt does not exist, it can be created with the command create('masvt','string','global').

The new Highland VT controller is autosensing, making masvt superfluous for systems with this controller.

Values: 'y' indicates the solids VT system is in use.

'n', any other value but 'n' and 'y', or if masvt does not exist, indicate that the Oxford Varian VT controller, if present, is in use.

See also: *VnmrJ Installation and Administration*

Related:

config	Display current configuration and possibly change values (M)
create	Create a new parameter in a parameter tree (C)
vttype	Variable temperature controller present (P)

maxattench1-4 Maximum limit for attenuator setting for rf channel 1-4 (P)

Description: maxattench1, maxattench2, maxattench3, and maxattench4, are optional global parameters for the limiting the maximum attenuator settings for rf channel 1, channel 2, channel 3, and channel 4 (respectively) from pulse sequence statements and through tpwr/dpwr/… settings on go command. If maxattench2 is present, the attenuator setting check will be carried out by SpinCAD and C psg. If the attenuator setting exceeds the limit set in maxattench2, psg aborts with error message. This command is only applicable for check during the go command.

See also: *SpinCAD*

maxpen Maximum number of pens to use (P)

Description: Controls the maximum number of pens that will be used.

Values: 1 to the number of pens in the system plotter. If maxpen=x and the software attempts to use pen x+y, it uses pen y instead.

See also: *NMR Spectroscopy User Guide*

Related:

pen	Select a pen or color for drawing (C)
setpen	Set maximum number of HP plotter pens (M)

md Move display parameters between experiments (C)

Syntax: md(<from_exp,>to_exp)

Description: Moves the saved display parameters from one experiment to another. These parameters must have been saved with the s command (e.g., s2).

Arguments: from_exp specifies the number of the experiment, 1 through 9, from which the parameters are to be taken. The default is that the parameters are moved from the currently active experiment.

to_exp specifies to which experiment the parameters are to be moved.

Examples:
```
md(4)
md(2,3)
```

See also: *NMR Spectroscopy User Guide*

Related:

mf	Move FIDs between experiments (C)
mp	Move parameters between experiments (C)
s	Save display parameters as a set (M)

menu — Change status of menu system (C)

Syntax: (1) `menu(menu_name)`
(2) `menu<('off')>`

Description: The VNMR menu system allows up to eight buttons to be active at a time, enabling the user to perform most actions with the mouse rather than typing in commands. All menus are stored in the library `menulib` in the system directory or in the user's `menulib`. See `menuvi` to change these menus.

If the menu system becomes deactivated for some reason, select the Menu On button in the Permanent Menu to reactivate it. Entering `menu('main')` also works.

Arguments: `menu_name` is the name of the file controlling the menu (e.g., `'main'`). Including this argument activates the menu system and displays the menu controlled by `menu_name`.

`'off'` is a keyword to turn off the menu system.

Examples:
```
menu
menu('fitspec')
menu('off')
```

See also: *User Programming*

Related:

`menuvi`	Edit a menu with the *vi* text editor (M)
`mlabel`	Menu label (P)
`newmenu`	Select a menu without immediate activation (C)

menuvi — Edit a menu with vi text editor (M)

Syntax: `menuvi(menu)`

Description: Edits a Classic VNMR menu file using the UNIX `vi` text editor. On the Sun workstation, a pop-up window contains the edit. On the GraphOn, the edit is done on the entire terminal.

Arguments: `menu` is the name of file controlling a menu.

Examples: `menuvi('display_1D')`

See also: *User Programming*

Related:

`menu`	Change status of menu system (C)
`newmenu`	Select a menu without immediate activation (C)
`vi`	Edit text file with `vi` text editor (C)

method — Autoshim method (P)

Description: Selects the method for automatic shimming. Refer to the manual *NMR Spectroscopy User Guide* for information on how to write or alter methods.

Values: Name of file in the `/vnmr/shimmethods` library for one of the defined shim methods in the system. To display all available methods, enter `ls('/vnmr/shimmethods')`. Standard methods include `'z1z2'` (selects shimming of the Z1 and Z2 gradients) and `'allzs'` (selects shimming all spinning gradients, Z1 to Z4 or Z5, depending on the magnet type). Shim methods can also be stored in a user's `shimmethods` directory (e.g., `/home/vnmr1/vnmrsys/shimmethods`).

See also: *NMR Spectroscopy User Guide*

Related:

`ls`	List files in current directory (C)
`newshm`	Interactively create a shim method with options (M)
`stdshm`	Interactively create a shim method (M)

M

mf — Move FIDs between experiments (C)

Syntax: `mf(<from_exp,>to_exp)`

Description: Moves the last acquired FID, as well as its associated parameters, from one experiment to another. The text, the processed acquisition parameters and the current display and processing parameters are also moved to the specified experiment.

Arguments: `from_exp` specifies number of the experiment from which the FID is to be taken. The default is the FID is moved from the currently active experiment.

`to_exp` specifies to which experiment the FID is to be moved.

Examples:
```
mf(4)
mf(3,2)
```

See also: *NMR Spectroscopy User Guide*

Related:

`md`	Move display parameters between experiments (C)
`mp`	Move parameters between experiments (C)

mfblk — Copy FID block (C)

Syntax: `mfblk(<src_expno,>src_blk_no,dest_expno,dest_blk_no)`

Description: Copies data from a source FID block specified by `src_blk_no` to a destination FID block specified by `dest_expno` and `dest_blk_no`, using memory-mapped input and output.

`mfblk` searches for the source and destination FID file in the directory `$vnmruser/expN/acqfil`, where `N` is the requested experiment number or the current experiment number. If the FID file is not open, `mfblk` opens the file, copies the data, and closes the file. If a number of blocks need to be copied, explicitly opening and closing the files with the commands `mfopen` and `mfclose` can significantly speed up the data reformatting process.

`mfblk` can also be used to append blocks of data to a FID file by specifying that the `dest_blk_no` is greater than the number of blocks in a file.

Be aware that `mfblk` can modify data returned to an experiment with the `rt` command. To avoid modification, enter the following sequence of VnmrJ commands before running `mfblk`:

```
cp(curexp+'/acqfil/fid',curexp+'/acqfil/fidtmp')
rm(curexp+'/acqfil/fid')
mv(curexp+'/acqfil/fidtmp',curexp+'/acqfil/fid')
```

Arguments: `src_expno` specifies the experiment number of the source FID file. The default is the FID file of the current experiment.

`src_blk_no` specifies the source block of data to be copied. Block numbers start at 1 and run from 1 to the number of blocks in a file.

`dest_expno` specifies the experiment number of the destination FID file.

`dest_blk_no` specifies the destination block to send the copied data.

Examples: `mfblk(1,2,1)` copies current experiment, block 1 to exp 2, block 1.
`mfblk(3,2,6,2)` copies exp 2, block 2 to exp 6, block 2.

See also: *User Programming*

Related:

`mfclose`	Memory map close FID file (C)
`mfdata`	Move FID data (C)
`mfopen`	Memory map open FID file (C)
`mftrace`	Move FID trace (C)

mfclose — Close memory map FID (C)

Description: Closes experiment source and destination FID files that have been explicitly opened with mfopen.

See also: *User Programming*

Related:

mfblk	Move FID block (C)
mfdata	Move FID data (C)
mfopen	Memory map open FID file (C)
mftrace	Move FID trace (C)
rfblk	Reverse FID block (C)
rfdata	Reverse FID data (C)
rftrace	Reverse FID trace (C)

mfdata — Move FID data (C)

Syntax:
```
mfdata(<src_expno,>src_blk_no,src_start_loc,  \
  dest_expno,dest_blk_no,dest_start_loc,num_points)
```

Description: Copies data specified by src_start_loc from a FID block specified by src_blk_no to a destination location specified by dest_expno, dest_blk_no, and dest_start_lo, using memory-mapped input and output. The data point locations and the num_points to be copied are specified by data points corresponding to the np parameter, not bytes or complex points.

mfdata searches for the source and destination FID file in th directory $vnmruser/expN/acqfil, where N is the requested experiment number or the current experiment number. If the FID file is not open, mfdata opens the file, copies the data, and closes the file. If a number of blocks need to be copied, explicitly opening and closing the files with the commands mfopen and mfclose can significantly speed up the data reformatting process.

Be aware that mfdata can modify data returned to an experiment with the rt command. To avoid modification, enter the following sequence of VnmrJ commands before running mfdata:

```
cp(curexp+'/acqfil/fid',curexp+'/acqfil/fidtmp')
rm(curexp+'/acqfil/fid')
mv(curexp+'/acqfil/fidtmp',curexp+'/acqfil/fid')
```

Arguments: src_expno specifies the experiment number of the source FID file. The default is the FID file of the current experiment.

src_blk_no specifies the source block of data to be copied. Block numbers start at 1 and run from 1 to the number of blocks in a file.

src_start_loc specifies the starting data location within the specified block to copy the data. Data locations start from 0 and are specified as data points corresponding to the np parameter.

dest_expno specifies the experiment number of the destination FID file.

dest_blk_no specifies the destination block to send the copied data.

dest_start_loc specifies the starting data destination location within the specified block to send the copied data.

Examples: mfdata(1,0,2,1,(nv-1)*np,np) copies np points of data from the starting location 0 of block 1 of the current experiment to the data location (nv-1)*np of block 1 of experiment 2.

See also: *User Programming*

Related:

mfblk	Move FID block (C)
mfclose	Memory map close FID file (C)
mfdata	Move FID data (C)

mfopen	Memory map open FID file (C)
mftrace	Move FID trace (C)
rfblk	Reverse FID block (C)
rftrace	Reverse FID trace (C)

mfopen — Memory map open FID file (C)

Syntax: `mfopen<(<src_expno,>dest_expno)>`

Description: Explicitly opens experiment source and destination FID files for using memory-mapped input and output. Opening a file explicitly can significantly speed up the data reformatting process.

`mfopen` searches for the FID file to be opened in the directory `$vnmruser/expN/acqfil`, where `N` is the requested experiment number or the current experiment number. Without arguments, `mfopen` assumes the source and destination files are the same and are in the current experiment.

After a file is open, the data reformatting commands `mfblk`, `mfdata`, `mftrace`, `rfblk`, `rfdata`, and `rftrace` can be used for moving around data. The `mfclose` must be used to close the file when data reformatting has been completed.

Arguments: `src_expno` specifies the experiment number of the source FID file. The default is the FID file of the current experiment.

`dest_expno` specifies the experiment number of the destination FID file.The default is the FID file of the current experiment.

If only one argument is provided, `mfopen` uses that as the experiment number of the destination FID file and assumes the source is the FID file of the current experiment.

Examples:
```
mfopen
mfopen(3)
mfopen(1,2)
```

See also: *User Programming*

Related:

mfblk	Move FID block (C)
mfclose	Memory map close FID file (C)
mfdata	Move FID data (C)
mftrace	Move FID trace (C)
rfblk	Reverse FID block (C)
rfdata	Reverse FID data (C)
rftrace	Reverse FID trace (C)

mftrace — Move FID trace (C)

Syntax:
```
mftrace(<src_expno,>src_blk_no,src_trace_no,  \
  dest_expno,dest_blk_no,dest_trace_no)
```

Description: Copies FID traces specified by `src_trace_no` from a FID block specified by `src_blk_no` to a destination location specified by `dest_expno`, `dest_blk_no`, and `dest_trace_no`, using memory-mapped input and output. If a number of blocks need to be copied, explicitly opening and closing the files with the commands `mfopen` and `mfclose` can significantly speed up the data reformatting process.

`mftrace` searches for the source and destination FID file in the directory `$vnmruser/expN/acqfil`, where `N` is the requested experiment number or the current experiment number. If the FID file is not open, `mftrace` opens the file, copies the data, and closes the file.

mftrace cannot be used to append data to a FID file. Its purpose is for moving around data.

Be aware that mftrace can modify data returned to an experiment with the rt command. To avoid modification, enter the following sequence of VnmrJ commands before running mftrace:

```
cp(curexp+'/acqfil/fid',curexp+'/acqfil/fidtmp')
rm(curexp+'/acqfil/fid')
mv(curexp+'/acqfil/fidtmp',curexp+'/acqfil/fid')
```

Arguments: src_expno specifies the experiment number of the source FID file. The default is the FID file of the current experiment.

src_blk_no specifies the source block of data to be copied. Block numbers start at 1 and run to the number of blocks in a file.

src_trace_no specifies the source trace of data within the specified block to be copied. Trace numbers run from 1 to number of traces in a file.

dest_expno specifies the experiment number of the destination FID file.

dest_blk_no specifies the destination block to send the copied data.

src_trace_no specifies the destination trace of data within the specified block to be copied. Trace numbers run from 1 to the number of traces in a file.

Examples: mftrace(1,1,2,1,nv) copies trace 1 from block 1 of the current experiment to trace nv of block 1 of experiment 2.

See also: *User Programming*

Related:

mfblk	Move FID block (C)
mfclose	Memory map close FID file (C)
mfdata	Move FID data (C)
mfopen	Memory map open FID file (C)
rftrace	Reverse FID trace (C)
rfblk	Reverse FID block (C)
rfdata	Reverse FID data (C)

minsw — Reduce spectral width to minimum required (M)

Description: Searches the spectrum for peaks, sets new limits accordingly, and then calls movesw to calculate a new transmitter offset tof and spectral width sw.

See also: *NMR Spectroscopy User Guide*

Related:

movesw	Move spectral window according to cursors (M)
movetof	Move transmitter offset (M)
sw	Spectral width in directly detected dimension (P)
tof	Frequency offset for transmitter offset (P)

mkdir — Create new directory (C)

Syntax: mkdir(directory)

Description: Creates a new UNIX directory. The function of the VnmrJ mkdir command is similar to the UNIX mkdir command.

Arguments: directory is the name of the new directory to be created.

Examples:

```
mkdir('tests')
mkdir('/home/george')
```

See also: *NMR Spectroscopy User Guide*

Related:

rmdir	Remove directory (C)

M

mlabel — Menu label (P)

Description: Stores the label for a menu button. Usually this parameter is arrayed, with one label for each button in the menu. This parameter is stored in a user's global file and is set whenever a menu is called.

See also: *User Programming*

Related:

menu	Change status of menu system (C)
mstring	Menu string (P)

move — Move to an absolute location to start a line (C)

Syntax: `move(<'graphics'|'plotter'>,x,y)`

Description: Moves the start of a line to an absolute location with the coordinates given as an argument. `move` is part of a line drawing capability that includes the `pen` and `draw` commands. `pen` selects the pen number of the plotter (`'pen1'`, `'pen2'`, etc.) or the color (`'red'`, `'green'`, `'blue'`, etc.). `move` sets the point from which to start drawing the line. `draw` draws a line from that point to the point given by the `draw` arguments. Refer to the description of the `draw` command for examples of using the line drawing capability.

Arguments: `'graphics'` and `'plotter'` are keywords selecting output to the graphics window or a plotter device. The default is `'plotter'`. The output selected is passed to subsequent `pen`, `move`, or `draw` commands, remaining unchanged until different output is specified.

`x,y` are the absolute coordinates, in mm, of a point to move to. The range of `x` is 0 at the left edge of the chart and `wcmax` at the right edge of the chart. The range of `y` is `-20` at the bottom of the chart and `wc2max` at the top.

See also: *NMR Spectroscopy User Guide*

Related:

draw	Draw line from current location to another location (C)
gin	Return current mouse position and button values (C)
pen	Select a pen or color for drawing (C)
wcmax	Maximum width of chart (P)
wc2max	Maximum width of chart in second direction (P)

movedssw — Set downsampling parameters for selected spectral region (M)

Description: Sets the parameters `dslsfrq` and `downsamp` to appropriate values for digital filtering and downsampling in a cursor-selected spectral region. To accomplish this, Fourier transform an oversampled data set, and then run the `ds` program. In the resulting spectral display, enclose the desired region with the cursors, and then run `movedssw`.

See also: *NMR Spectroscopy User Guide*

Related:

downsamp	Downsampling factor applied after digital filtering (P)
ds	Display a spectrum (C)
dslsfrq	Bandpass filter offset for downsampling (P)

moveossw — Set oversampling parameters for selected spectral region (M)

Description: Sets the parameters `oslsfrq` and `sw` to appropriate values for oversampling and digital filtering in a cursor-selected spectral region. To accomplish this, acquire a data set without digital filtering, and then run the `ds` program. In the resulting spectral display, enclose the desired region with the cursors, and then run `moveossw`. The value of `oversamp` is manually set.

See also: *NMR Spectroscopy User Guide*

Related:

ds	Display a spectrum (C)
oslsfrq	Bandpass filter offset for oversampling (P)
oversamp	Oversampling factor for acquisition (P)
sw	Spectral width in directly detected dimension (P)

movesw — Move spectral window according to cursors (M)

Syntax: movesw<(width)>

Description: Uses the parameters cr and delta to calculate a new transmitter offset tof and a new spectral width sw. If referencing was used, it is also adjusted. The movesw macro also sets sp and wp to display the spectral window.

Arguments: width specifies the spectral width sw. The default is to use a value calculated from the parameter delta.

Examples:
```
movesw
movesw(5000)
```

See also: *NMR Spectroscopy User Guide*

Related:

cr	Cursor position in directly detected dimension (P)
delta	Cursor difference in directly detected dimension (P)
minsw	Reduce spectral width to minimum required (M)
movetof	Move transmitter offset (M)
sp	Start of plot (P)
sw	Spectral width in directly detected dimension (P)
tof	Frequency offset for observe transmitter (P)
wp	Width of plot (P)

movetof — Move transmitter offset (M)

Syntax: movetof<(frequency)>

Description: Moves the transmitter offset parameter tof so that the current cursor position, defined by cr, becomes the center of the spectrum. If referencing was used, movetof maintains the referencing.

Arguments: frequency specifies the transmitter frequency rather than using the cursor position to define the frequency. This provides a convenient method of moving the transmitter frequency outside the current spectral window.

See also: *NMR Spectroscopy User Guide*

Related:

cr	Cursor position in directly detected dimension (P)
minsw	Reduce spectral width to minimum required (M)
movesw	Move spectral window according to cursors (M)
tof	Frequency offset for observe transmitter (P)

mp — Move parameters between experiments (C)

Syntax: mp(<from_exp,>to_exp)

Description: Moves text and the current display, processing, and acquisition parameters from one experiment to another. No FID is transferred.

Arguments: from_exp specifies the number of the experiment from which the parameters are to be taken; default is the parameters are moved from the currently active experiment.

to_exp specifies to which experiment the parameters are to be moved.

Examples: `mp(4)`
`mp(2,3)`

See also: *NMR Spectroscopy User Guide*

Related:

`md`	Move display parameters between experiments (C)
`mf`	Move FIDs between experiments (C)

`mqcosy` Set up parameters for MQCOSY pulse sequence (M)

Syntax: `mqcosy<(level)>`

Description: Sets up a multiple-quantum filtered COSY experiment.

Arguments: `level` is the desired quantum level of filtration.

Examples:
```
mqcosy
mqcosy(3)
```

See also: *NMR Spectroscopy User Guide*

`mref` Set referencing based on a existing spectrum of the sample (M)

Syntax:
```
mref(<source_exp,>target_exp)<:$ret>
mref(source_fid)<:$ret>
```

Description: Use a primary referenced spectrum to reference a secondary spectrum acquired in another work space (or experiment) at the same temperature, using the same lock sample, and either a different or the same nucleus without adding a secondary reference sample. The primary spectrum must be properly referenced using the IUPAC recommended Ξ values. Ξ is the normalized frequency such that the ^{1}H signal from TMS is 100.00 MHz.

Begin with a `source_exp` spectrum (typically a ^{1}H spectrum) and reference it using an internal reference (such as TMS, see the IUPAC recommendations).

Join a different experiment and acquire a `target_exp` spectrum on a different (or same) nucleus. Enter `mref(<source_exp,>target_exp)`.

Referencing of 2D data sets using `mref` only applies to the directly detected dimension. The indirect dimensions is referenced using `reff1` and `reff2` (after using `mref` or after manual referencing of the observe dimension). The reference frequency for the secondary spectrum, `reffrq_b`, is calculated as follows:

`reffrq_b = (reffrq_a / Ξ`$_{a}$`) * Ξ`$_{b}$

`mref` also corrects for possible changes in the lock frequency:

```
reffrq_b = (reffrq_a / lockfreq_a) * lockfreq_b
```

`mref` works if the lock frequency changed between the two acquisitions, if the two spectra were acquired on different instruments, or at different field strengths.

`mref` calculates `rfl` and `rfp` after calculating `reffrq`:

```
rfp = 0
rfl = sw/2 - (sfrq - reffrq) * 1e6
```

The systemglobal parameters `lockfreq` and `h1freq` must saved in the local parameters using the `saveglobal` mechanism when the go command is executed. The `mref` macro only tracks lock frequency changes if these `systemglobal` parameters are saved in the local parameters.

The `mref` macro works with earlier data if both data sets were:

- acquired at the same lock frequency (on the same instrument).

- the `lockfreq` (on a data station) and (on older instruments) `h1freq` parameters are set to the values used to acquire the data.

Referencing action from `mref` are reported the on line 3. Suppress the report by suppling a return argument, e.g.:

```
$ret='' mref('myfid.fid'):$ret
```

The referencing message is captured in the return argument "$ret" and the contents of this string variable can be used to label plots with the referencing information.

Limitations: the macro works with data recalled from an archive or acquired on an other system provided the data was acquired using VNMR6.1C or newer.

Setting the global (or local) flag `bioref='y'` enables Bio-NMR referencing (based on `nuctables/nuctabrefBio`) and disables standard IUPAC / organic chemistry referencing (based on `nuctables/nuctabref`).

See `/vnmr/nuctables/nuctabref`.

Arguments: `source_exp` — experiment containing the primary referenced spectrum or the full (or relative) path and fid file name containing the primary references spectrum.

`target_exp` — experiment contining spectra to be referenced based upon the primary experiment referencing.

`$ret` — return argument for output of `mref`.

Alternatively, the name of a FID file (with or without extension) can be given as a single argument; in this case, the data in the CURRENT experiment are referenced based on the referencing in the specified FID file.

Examples: `mref(3)` — uses the current experiment as the source and applies the reference to the specified experiment as the target.

`mref(1,2)` — experiment 1 is the source and experiment 2 is the target.

```
mref('myfid')
mref('/data/fids/myfid.fid')
```

Related

`setref`	Set Frequency Referencing Based on Lock Signal Shift (M)
`setref1`	Set Frequency Referencing for f1 Evolution Dimension (M)
`setref2`	Set Frequency Referencing for f2 Evolution Dimension (M)
`reff1`	Reference f1 Indirect Dimension from Observe Dimension (M)
`reff2`	Reference f2 Indirect Dimension from Observe Dimension (M)
`bioref`	Flag for Bio-NMR Referencing (P)

`mrev8` Set up parameters for MREV8 pulse sequence (M)

Applicability: Systems with a solids module.

Description: Converts FLIPFLOP, BR24, or S2PUL parameter set into the MREV8 multiple-pulse line narrowing sequence.

See also: *User Guide: Solid-State NMR*

Related:

`br24`	Set up parameters for BR24 pulse sequence (M)
`cylmrev`	Set up parameters for cycled MREV8 pulse sequence (M)
`flipflop`	Set up parameters for FLIPFLOP pulse sequence (M)
`s2pul`	Set up parameters for standard two-pulse sequence (M)

`mrfb` Set the filter bandwidths for multiple receivers (P)

Applicability: Systems with multiple receivers

Description: An array of `fb` settings to apply to individual receivers in a multiple receiver system. The first element applies to the first receiver, the second to the second receiver, and so on. If `mrfb` exists and is active, these settings override the setting specified by the `fb` parameter; otherwise, `fb` is used as the filter bandwidth setting for all receivers. If there are fewer elements in `mrfb` than there are receivers, the remaining receivers are set to the `fb` value.

Note that some older multiple receiver systems do not have the hardware to provide individual receiver control. In that case, the filter setting for receiver 1 is used on receivers 1 and 2 and the setting for receiver 3 is used on receivers 3 and 4.

Also note that `mrfb` is not automatically set when `sw` is changed. Normally, you can leave `mrfb` inactive and let `fb` be used for all receivers.

Examples: `mrfb=fb/3,fb/2` sets the filter bandwidth of the first receiver to `fb/3`, the second to `fb/2`, and of the rest to `fb`.

Related: `fb` Filter bandwidth (P)

`mrgain` Set the gain for multiple receivers (P)

Applicability: Systems with multiple receivers

Description: An array of `'gain'` settings to apply to individual receivers in a multiple receiver system. If it exists and is active, these settings override the setting specified by the `'gain'` parameter; otherwise, `'gain'` is used as the gain setting for all receivers.
Note that not all multiple receiver systems have the hardware set up to provide individual receiver control. In that case, the gain setting for receiver 1 is used on receivers 1 and 2 and the setting for receiver 3 is used on receivers 3 and 4.

Examples: `mrgain=30,40,20` sets the gains of receiver 1 to 30, receiver 2 to 40 and receivers 3 and 4 to 20.

Related: `gain` Receiver gain (P)

`mstat` Display memory usage statistics (C)

Syntax:
```
mstat<(program_id)>
```

Description: Displays statistics on memory usage by programs that use the procedures `allocateWithId` and `release`.

Arguments: `program_id` is the program ID, usually the same name as the program. The default is to display all program IDs and associated memory statistics.

Examples:
```
mstat
mstat('proc2d')
```

See also: *User Programming*

`mstring` Menu string (P)

Description: Stores command strings to be executed when a VnmrJ menu button is clicked. Usually the `mstring` parameter is arrayed, with one string for each button in the menu. The string can be any string of commands that can otherwise appear in a macro or on the command line. This parameter is stored in a user's global file and is set whenever a menu is called.

See also: *User Programming*

Related:

menu	Change status of menu system (C)
mlabel	Menu label (P)

mtune — Tune probe using swept-tune graphical display (M)

Description: mtune replaces qtune on the Varian NMR System and/or Linux. mtune runs in the spectra screen and uses VnmrJ panels. Enter mtune to retrieve parameters and panels.

- all parameters changeable on-the-fly (exception: tune channel for the Varian NMR System).
- one or two markers are selectable to tune at the same time.
- vertical autoscale button.
- number of acquired points changeable for better resolution at large spectral widths (more points will update less often).
- quit button returns user to current experiment and returns mtune to the original frequencies.

See also: *NMR Spectroscopy User Guide*

Related:

tchan	RF channel number used for tuning (P)
tugain	Amount of receiver gain used by qtune (P)
tune	Assign frequencies (C)

mv — Move and/or rename a file (C)

Syntax: `mv(from_file,to_file)`

Description: Renames and/or moves a file or directory. mv functions the same as the command rename.

Arguments: from_file is the name of the file to be moved and/or renamed.

to_file is the new name of the file and/or the new location. If the from_file argument has an extension such as .fid or .par, be sure the to_file argument has the same extension.

Examples:

```
mv('/home/vnmr1/vnmrsys/seqlib/d2pul',
   '/vnmr/seqlib/d2pul')
```

See also: *NMR Spectroscopy User Guide*

Related:

copy	Copy a file (C)
cp	Copy a file (C)
delete	Delete a file, parameter directory, or FID directory (C)
rename	Move and/or rename a file (C)
rm	Delete a file (C)

mxconst — Maximum scaling constant (P)

Description: Before the start of data acquisition, noise is sampled to determine the number of bits of noise present. This number is used to set the maximum number of scaling operations on the data that can occur (essentially relevant only if dp='n'). mxconst is used to adjust this amount of scaling.

Increasing mxconst to 1, for example, permits additional scaling operations, allowing acquisition to proceed slightly longer in single-precision mode. Decreasing mxconst to −1 allows fewer scaling operations before reaching the message “maximum transients accumulated”.

One special case exists. If `mxconst` is set to less than `-90` and single-precision acquisition is used (`dp='n'`), then scaling of the data is disabled. In this mode, reports of data overflowing the 16 bits is also disabled.

`mxconst` does not exist in standard parameter sets. If it does not exist, its value defaults to 0. To modify `mxconst`, first create it by entering `create('mxconst','integer')` and then enter the desired value.

CAUTION: **Do not change `mxconst` unless you are fully aware of the consequences.**

See also: *NMR Spectroscopy User Guide*

Related:

`create`	Create new parameter in a parameter tree (C)
`dp`	Double precision (P)

N

n1,n2,n3	Name storage for macros (P)
newmenu	Select a menu without immediate activation (C)
newshm	Interactively create a shim method with options (M)
nextpl	Display the next 3D plane (M)
nfni	Number of increments in 1st indirectly detected dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
ni3	Number of increments in 3rd indirectly detected dimension (P)
niter	Number of iterations (P)
nimax	Maximum limit of ni (P)
nl	Position cursor at the nearest line (C)
nli	Find integral values (C)
nlivast	Produces a text file of integral regions without a sum region (M)
nlivast2	Produces a text file with normalized integral regions (M)
nlivast3	Produces a text file with normalized integral regions (M)
nll	Find line frequencies and intensities (C)
nm	Select normalized intensity mode (C)
nm2d	Select Automatic 2D normalization (M)
Noesy	Convert the parameter to a NOESY experiment (M)
Noesy1d	Convert the parameter set to a Noesy1d experiment (M)
noise	Measure noise level of FID (C)
noisemult	Control noise multiplier for automatic 2D processing (M)
noislm	Limit noise in spectrum (M)
notebook	Notebook name (P)
np	Number of data points (P)
npoint	Number of points for fp peak search (P)
nrecords	Determine number of lines in a file (M)
nt	Number of transients (P)
ntrig	Number of trigger signals to wait before acquisition (P)
ntype3d	Specify whether f_1 or f_2 display expected to be N-type (P)
nuctable	Display VNMR style nucleus table for a given H1 frequency (M)
numrcvrs	Number of receivers in the system (P)
numreg	Return the number of regions in a spectrum (C)
numrfch	Number of rf channels (P)

n1,n2,n3 Name storage for macros (P)

Description: Stores arbitrary character strings for macros. Each experiment has these three string parameters available.

See also: *User Programming*

Related:
- dgs — Display group of special/automation parameters (M)
- r1–r7 — Real value storage for macros (P)

N

newmenu — Select a menu without immediate activation (C)

Syntax: (1) `newmenu(menu_name)`
(2) `newmenu:$current_menu`

Description: Selects a menu but does not activate it (syntax 1). This is most useful when picking which menu will be active when an interactive command exits. `newmenu` can also return the name of the currently active menu (syntax 2).

Arguments: `menu_name` is the name of the file controlling the menu selected. For example, the command string `newmenu('manipulate_1D') ds` causes the menu controlled by `manipulate_1D` to be displayed when the Return button in the `ds` menu is selected.

`$current_menu` returns the file name of the currently active menu.

Examples:
```
newmenu('display_1D')
newmenu:$name1
```

See also: *User Programming*

Related:

`menu`	Change status of menu system (C)
`menuvi`	Edit a menu with the *vi* text editor (M)

newshm — Interactively create a shim method with options (M)

Syntax: `newshm`

Description: Interactively creates a *method* string to be used in autoshimming of the magnetic field homogeneity. The string may consist of a series of shimming operations. The command `dshim('method')` describes method strings. Any text editor may be used to make and modify the strings.

`newshm` provides for either lock shimming or FID shimming, permitting the user to choose whichever is best. Lock shimming is much faster, but FID shimming is frequently much more effective in improving the field. With FID shimming, the FID evaluation range limits are requested. The full range is 0 to 100. Sensitivity to higher order gradients is greatly increased by setting the finish limit to about 5 or 10 with the start limit at 0.

`newshm` begins by asking for the name of the user's new shim method. If the non-spin (transverse) controls are chosen for adjustment, the spinner is turned off; otherwise, it is turned on. If uncertain about the shim criteria, the “medium to medium” choice is suitable in most circumstances. The new method is found in `curexp+'/.../shimmethods`.

To shim after running `newshm`, type `method='methodname'` and then enter `shim` or set the `wshim` parameter to shim before the start of acquisition. `'methodname'` is the name supplied to `newshm`. For more information on shimming, see the manual *NMR Spectroscopy User Guide*.

Compared to `stdshm`, the `newshm` macro is more flexible and provides for a shimming time and FID evaluation limits supplied by the user. The primary difference between the macros is that `stdshm` provides for determining an estimated shimming time for the selected shim controls. When no time limit is supplied, autoshim continues until the exit criteria is met or the number of cycles reaches a limit.

See also: *NMR Spectroscopy User Guide*

Related:

`curexp`	Current experiment directory (P)
`dshim`	Display a shim method string (M)
`method`	Autoshim method (P)
`shim`	Submit an Autoshim experiment to acquisition (C)
`stdshm`	Interactively create a shim method (M)

wshim	Conditions when shimming is performed (P)
vi	Edit text file with vi text editor (C)

nextpl — Display the next 3D plane (M)

Syntax: nextpl

Description: Displays the 2D color map of the next 3D plane in the set of planes defined by the parameters plane and path3d. If nextpl immediately follows the command dproj, nextpl results in the display of the first 3D plane within that specified set and is therefore equivalent to the command dplane(1). For example, if dplane(40) has just been executed, nextpl results in the display of 3D plane 41 of that set. The nextpl macro is more efficient than dplane or dproj because the 3D parameter set (procpar3d) is not loaded into VnmrJ—it is assumed to have already been loaded by dplane or dproj, for example.

See also: *NMR Spectroscopy User Guide*

Related:

dplane	Display a 3D plane (M)
dproj	Display a 3D plane projection (M)
dsplanes	Display a series of 3D planes (M)
getplane	Extract planes from a 3D spectral data set (M)
path3d	Path to currently displayed 2D planes from a 3D data set (P)
plane	Currently displayed 3D plane type (P)
plplanes	Plot a series of 3D planes (M)
prevpl	Display the previous 3D plane (M)

nfni — Number of increments in 1st indirectly detected dimension (P)

Description: Number of increments of the evolution time d2, and thus the number of FIDs that will comprise the first indirectly detected dimension of a multidimensional data set. To create parameters ni, phase, and sw1 to acquire a 2D data set in the current experiment, enter addpar('2d').

Values: 8 is minimum; typical values range from 32 to 512. In microimaging, ni greater than 0 is the imaging mode and ni equal to 0 is the projection mode.

See also: *NMR Spectroscopy User Guide; VnmrJ Imaging NMR*

Related:

addpar	Add selected parameters to the current experiment (M)
celem	Completed FID elements (P)
d2	Incremented delay in 1st indirectly detected dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)

ni2 — Number of increments in 2nd indirectly detected dimension (P)

Description: Number of increments of the evolution time d3, and thus the number of FIDs that will comprise the second indirectly detected dimension of a multidimensional data set. To create parameters d3, ni2, phase2, and sw2 to acquire a 3D data set in the current experiment, enter addpar('3d').

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
d3	Incremented delay in 2nd indirectly detected dimension (P)
ni	Number of increments in 1st indirectly detected dimension (P)
par3d	Create 3D acquisition, processing, and display parameters (M)
phase2	Phase selection for 3D acquisition (P)
sw2	Spectral width in 2nd indirectly detected dimension (P)

N

ni3 — Number of increments in 3rd indirectly detected dimension (P)

Description: Number of increments of the evolution time d4, and thus the number of FIDs that will comprise the third indirectly detected dimension of a multidimensional data set. To create parameters d4, ni3, phase3. and sw3 to acquire a 4D data set in the current experiment, enter addpar('4d').

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
d4	Incremented delay in 3rd indirectly detected dimension (P)
ni	Number of increments in 1st indirectly detected dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
par4d	Create 4D acquisition parameters (M)
phase3	Phase selection for 4D acquisition (P)
sw3	Spectral width in 3rd indirectly detected dimension (P)

niter — Number of iterations (P)

Description: Sets the maximum number of iterations in an iterative simulation.

Values: 1 to 9999. The value is initialized to 20 if the Set Params button is used in setting up spin simulation parameters.

See also: *NMR Spectroscopy User Guide*

nimax — Maximum limit of ni (P)

Description: Maximum limit of ni. Used to prevent running an unrealistic number of Hadamard-encoded experiments.

Values: Any positive real integer.

See also: *NMR Spectroscopy User Guide*

Related:

sethtfrq1	Set a Hadamard frequency list from a line list (M)
ni	Number of increments in 1st indirectly detected dimension (P)
htfrq1	Hadamard frequency in ni (P)

nl — Position cursor at the nearest line (C)

Syntax: nl<:height<,frequency>>

Description: Moves the cursor to the nearest calculated line position.

Arguments: height is a return value set to the height of the line.

frequency is a return value set to the frequency of the line.

Examples:

```
nl
nl:r1,r2
```

See also: *NMR Spectroscopy User Guide*

nli — Find integral values (C)

Description: Equivalent to the dli command except that no screen display is produced. For a list of integrals, nli stores the reset points in the parameter lifrq and stores the amplitudes in the parameter liamp.

See also: *NMR Spectroscopy User Guide*

Related:

cz	Clear integral reset points (C)
dli	Display list of integrals (C)
dlni	Display list of normalized integrals (M)

liamp	Amplitudes of integral reset points (P)
lifrq	Frequencies of integral reset points (P)
z	Add integral reset point at cursor position (C)

nlivast — Produces a text file of integral regions without a sum region (M)

Applicability: Systems with VAST accessory.

Syntax: `nlivast(last)`

Description: Using predefined integral regions from the spectra for each well, `nlivast` writes a text file, integ.out, containing the integrals of the regions. The file is written into the current experiment. Does not add an additional region that is the sum of all the defined regions for each well (see dlivast).

Arguments: `last` is the number of the last well. The default is 96.

See also: *NMR Spectroscopy User Guide*

nlivast2 — Produces a text file with normalized integral regions (M)

Applicability: Systems with VAST accessory.

Syntax: `nlivast(well)`

Description: Using predefined integral regions from the spectra for each well, `nlivast2` writes a text file, integ.out, containing the integrals of the regions. The file is written into the current experiment. Integrals are normalized to the integral specified by the argument `well`. The macro `nlivast2` does not add an additional region that is the sum of all the defined regions for each well (see dlivast). All of the spectra are integrated.

Arguments: `well` is the number of the reference sample well. The default reference is well 96.

See also: *NMR Spectroscopy User Guide*

nlivast3 — Produces a text file with normalized integral regions (M)

Applicability: Systems with VAST accessory.

Syntax: `nlivast(well)`

Description: Using predefined integral regions from the spectra for each well, `nlivast3` writes a text file, integ.out, containing the integrals of the regions. The file is written into the current experiment. Integrals are referenced to the integral specified by the argument `well`. The integral of spectrum from the sample specified by `well` is set to 1000. The macro `nlivast3` does not add an additional region that is the sum of all the defined regions for each well (see dlivast). All of the spectra are integrated.

Arguments: `well` is the number of the reference sample well. Reference integral set to 1000. The default reference is well 96.

See also: *NMR Spectroscopy User Guide*

nll — Find line frequencies and intensities (C)

Syntax: `nll<('pos'<,noise_mult>)><:number_lines,scale>`

Description: Equivalent to the command `dll` except that the line listing is not displayed or printed. The results of this calculation are stored in `llfrq` and `llamp`. The frequencies are stored as Hz and are not referenced to `rfl` and `rfp`. Amplitudes are stored as the actual data point value; they are not scaled by `vs`.

Arguments: `'pos'` is a keyword that causes only positive lines to be listed.

`noise_mult` is a numerical value that determines the number of noise peaks listed for broad, noisy peak. The default is 3. A smaller value results in more peaks, a larger value results in fewer peaks, and a value of 0.0 results in a line listing containing all peaks above the threshold `th`. Negative values of `noise_mult` are changed to 3.

`number_lines` is a return argument with the number of lines in the line list.

`scale` is a return argument with a scaling factor for line amplitudes. This scaling factor accounts for `vs` and whether the lines are listed in absolute intensity mode or normalized mode.

Examples:
```
nll:n1
nll('pos'):pn
nll(2.5),sc
```

See also: *User Programming*

Related:

`dll`	Display listed line frequencies and intensities (C)
`llamp`	List of line amplitudes (P)
`llfrq`	List of line frequencies (P)

nm — Select normalized intensity mode (C)

Description: Selects the normalized intensity mode in which spectra are scaled so that the largest peak in the spectrum is `vs` mm high. The alternative is the absolute intensity mode (selected by the `ai` command) in which the scale is kept constant from spectrum to spectrum to allow comparison of peak heights from one spectrum to another. The modes are mutually exclusive (i.e., the system is always in either `nm` or `ai` mode). Enter `aig?` to show which mode is currently active.

See also: *NMR Spectroscopy User Guide*

Related:

`ai`	Select absolute intensity mode (C)
`aig`	Absolute intensity group (P)
`vs`	Vertical scale (P)

nm2d — Select Automatic 2D normalization (M)

Syntax: `nm2d<(noisemult)>`

Description: Sets up parameters `th` and `vs2d` automatically for a 2D contour plot and color map display. `nm2d` measures the highest signal in the spectrum and sets `vs2d` so that the highest signal is in the range of the highest color level. It then calculates the noise threshold so that the number of points above the noise threshold is between 10% and 30% of all the points. At the same time, the difference between the mean value of all the points above the threshold (peak points) and the mean value of all the points under the threshold (noise points) is maximized. This noise threshold is then multiplied by the noise multiplier.

`nm2d` works both with absolute-value and phase-sensitive spectra. `trace` can be set to `'f1'` or `'f2'`.

Arguments: `noisemult` specifies the noise multiplier number that multiplies the noise threshold:

- For ^{1}H, ^{19}F and ^{31}P (high dynamic range nuclei), and homonuclear spectra in general, the default value is 4.
- For HMQC/HSQC type spectra, the default value is also 4 but noise multipliers of 3 to 5 are often more adequate.
- For HETCOR and 2D-INADEQUATE spectra, the default value is 2.

- For “quick & dirty” COSY spectra with lots of t1 noise and other artifacts, a value of 8 and higher may be adequate for suppressing the artifacts.
- For 2D-INADEQUATE spectra, a value below 3 is appropriate to catch signals right above the noise level.
- If the multiplied noise threshold is below `th=1`, `vs2d` is scaled up; otherwise, `th` is increased to the desired level.
- Minimum value is 1.5 (if a lower value is entered, the value is set to 1.5).

Examples:
```
nm2d
nm2d(3)
```

See also: *NMR Spectroscopy User Guide*

Related:

`dconi`	Interactive 2D contour display (C)
`noisemult`	Control noise multiplier for automatic 2D processing (M)
`proc2d`	Process 2D spectra (M)
`th`	Threshold (P)
`trace`	Mode for *n*-dimensional data display (P)
`vs2d`	Vertical scale for 2D displays (P)

`Noesy` Convert the parameter to a NOESY experiment (M)

Description: Convert the parameter to a NOESY experiment.

See also: *NMR Spectroscopy User Guide*

Related:

`foldt`	Fold COSY-like spectrum along diagonal axis (C)

`Noesy1d` Convert the parameter set to a Noesy1d experiment (M)

Description: Convert the parameter set to a NOESY 1D experiment.

See also: *NMR Spectroscopy User Guide*

Related:

`Proton`	Set up parameters for ^{1}H experiment (M).
`sel1d`	Selective 1D protocols to set up (M).

`noise` Measure noise level of FID (C)

Syntax:
```
noise<(excess_noise<,last_noise<,block_number>>)>
   :r1,r2,r3,r4,r5,r6
```

Description: Measures the noise level of a FID. By using `pw=0` so that no real signal is accumulated, one or more transients can be acquired. The value of `np` must be greater than 4096. `noise` then performs a statistical analysis of the noise, providing noise level, dc level, etc., for each channel. The noise level measurement can be repeated at various settings of `gain` and various settings of `fb`, etc., for a full system diagnosis.

Arguments: `excess_noise` is excess noise and is used to calculate the noise figure.

`last_noise` is the last measured mean square noise and is used to calculate the noise figure.

`block_number` is the block number. The default is 1.

`r1` returns the real dc offset.

`r2` returns the imaginary dc offset.

`r3` returns the real rms noise.

`r4` returns the imaginary rms noise.

`r5` returns the average rms noise.

`r6` returns the percentage channel imbalance.

`r7` returns the noise figure.

See also: *NMR Spectroscopy User Guide*

Related:

`ddf`	Display data file in current experiment (C)
`ddff`	Display FID file in current experiment (C)
`ddfp`	Display phase file in current experiment (C)
`fb`	Filter bandwidth (P)
`gain`	Receiver gain (P)
`np`	Number of data points (P)
`pw`	Pulse width (P)

`noisemult` Control noise multiplier for automatic 2D processing (M)

Syntax: `noisemult<(noise_multiplier)>`

Description: Predetermines the noise multiplier used by the `nm2d` macro when starting automatic 2D experiments. This multiplier determines the threshold level in 2D spectra.

Arguments: `noise_multiplier` is a noise multiplier, the same as used in the `nm2d` macro. The default is 8 for homonuclear 2D spectra or 4 for other spectra.

Examples:

```
noisemult
noisemult(10)
```

See also: *NMR Spectroscopy User Guide*

Related:

`nm2d`	Automatic 2D normalization (M)
`proc2d`	Process 2D spectra (M)

`noislm` Limit noise in spectrum (M)

Syntax: `noislm<(max_noise)>`

Description: Limits the noise present in a spectrum by reducing the vertical scale `vs`. If the noise is smaller than the noise limit, `vs` is left untouched. The noise limit is in single root-mean-square noise size; the peak-to-peak noise (width of the noise band) is about twice that value. The noise is determined by taking the smallest value from four 5% regions at the left end of the spectrum. Any filter cutoff at the end will decrease the apparent noise in the spectrum, and therefore increase the noise limit in the central part of the spectrum. Because of the particular algorithm used in this macro, signals at the left end of the spectrum should not affect the result of `noislm`.

Arguments: `max_noise` is the maximum root-mean-square size, in mm, of the noise. The default is 2.

Examples:

```
noislm
noislm(5)
```

See also: *NMR Spectroscopy User Guide*

Related:

`vs`	Vertical scale (P)
`vsadj`	Automatic vertical scale adjustment (M)
`vsadjc`	Automatic vertical scale adjustment for ^{13}C spectra (M)
`vsadjh`	Automatic vertical scale adjustment for ^{1}H spectra (M)

`notebook` Notebook name (P)

Description: Specifies the notebook name of a sample, which is saved with a study.

Related:		
	cqsavestudy	Macro to save study queue parameters (M)
	page	Name of page (P)
	samplename	Sample name (P)
	studypar	Study parameters (P)

np — Number of data points (P)

Description: Sets number of data points to be acquired. Generally, np is a *dependent* parameter and is calculated automatically when sw or at is changed. If a particular number of data points is desired, np can be entered, in which case at becomes the dependent parameter and is calculated based on sw and np.

Values: np is constrained to be a multiple of 2 (Acquisition Controller or Pulse Sequence Controller board) or a multiple of 64 (Output board). (See the acquire statement in the manual *User Programming* for a description of these boards.)

See also: *NMR Spectroscopy User Guide*

Related:		
	at	Acquisition time (P)
	dp	Double precision (P)
	setlimit	Set limits of a parameter in a tree (C)
	sw	Spectral width in directly detected dimension (P)

npoint — Number of points for fp peak search (P)

Description: If npoint is defined in the current parameter set and has a value, it determines the range of data points over which the fp command searches for a maximum for each peak. To create npoint and give it a value other than the default, enter create('npoint','integer') npoint=x, where x is the new value.

Values: 1 to fn/4. The default is 2.

See also: *NMR Spectroscopy User Guide*

Related:		
	create	Create new parameter in a parameter tree (C)
	fn	Fourier number in directly detected dimension (P)
	fp	Find peak heights (C)

nrecords — Determine number of lines in a file (M)

Syntax: nrecords(file):$number_lines

Description: Returns the number of lines (or records) in a file.

Arguments: file is the name of the file.

$number_lines returns the number of lines in the named file.

Examples: nrecords(userdir+'/mark1d.out'):$num

See also: *User Programming*

nt — Number of transients (P)

Description: Sets the number of transients to be acquired (i.e., the number of repetitions or scans performed to make up the experiment or FID).

Values: 1 to 1e9. For an indefinite acquisition, set nt to a very large number such as 1e9.

See also: *NMR Spectroscopy User Guide; VnmrJ Imaging NMR*

N

ntrig **Number of trigger signals to wait before acquisition (P)**

Applicability: Systems with LC-NMR accessory.

Description: Sets the number of trigger signals from the LC to wait for on the external gate line before beginning acquisition. If `ntrig` is 0 or the parameter does not exist, the external gate signal is ignored. If `ntrig` noes not exist, the `parlc` macro can create it. `ntrig` is not normally entered by the user.

See also: *NMR Spectroscopy User Guide*

Related:

`parlc`	Create LC-NMR parameters (M)

ntype3d **Specify whether f_1 or f_2 display expected to be N-type (P)**

Description: Indicates whether the f_1 or f_2 display is expected to be N-type, that is, opposite to the sense of precession defined by f_3, under normal 3D processing conditions.

Values: `'yn'` specifies that f_1 is expected to have an N-type display under normal 3D processing conditions.

`'ny'` specifies that f_2 is expected to have an N-type display under normal 3D processing conditions.

`'yy'` specifies that both f_1 and f_2 are expected to have N-type displays under normal 3D processing conditions. Setting `ntype3d='yy'` changes the sense of precession in f_1 and f_2 by negating the imaginary portion of the t_1 and t_2 interferograms prior to Fourier transformation.

See also: *NMR Spectroscopy User Guide*

Related:

`fiddc3d`	3D time-domain dc correction (P)
`ft3d`	Perform a 3D Fourier transform on a 3D FID data set (M,U)
`ptspec3d`	Region-selective 3D processing (P)
`specdc3d`	3D spectral dc correction (P)
`ssfilter`	Full bandwidth of digital filter to yield a filtered FID (P)
`ssorder`	Order of polynomial to fit digitally filtered FID (P)
`rftype`	Type of rf generation

nuctable **Display VNMR style nucleus table for a given H1 frequency (M)**

Syntax: `nuctable<(h1_freq)>`

Description: The VnmrJ nucleus table is a single nucleus table, `/vnmr/nuctables/nuctable`, which is calculated based on a proton frequency of 1000.000 MHz. `nuctable` can be used to reconstruct a traditional nucleus table, e.g., based on a proton frequency of 200.057 MHz, or to calculate a nucleus table for any given proton frequency.

Arguments: `h1_freq` (optional): proton frequency on which the calculated / displayed nucleus table will be based. Without argument, `nuctable` prints a nucleus table based on the proton frequency for which the current VnmrJ / VNMR installation is configured.

Examples:
```
nuctable(200.057)
nuctable:
```

Related:

`restorenuctable`	Calculate and (Re-)store accurate nuctable (M)

numrcvrs **Number of receivers in the system (P)**

Applicability: Systems with multiple receivers.

Description: An integer giving the number of receivers installed in the system. `numrcvrs` is set from the config panel by the vnmr1 user.

numreg — Return the number of regions in a spectrum (C)

Syntax: `numreg:number_regions`

Description: Returns the number of regions in a spectrum previously divided by the `region` command, by manual means using the `z` command, or by the Resets button in `ds`. A *region* is the area between two reset points in integral mode, with every other reset point designating the start of a *baseline* region and not included in the count of regions.

Arguments: `number_regions` returns the number of peak regions in the spectrum.

Examples: `numreg:$num`

See also: *User Programming*

Related:

`ds`	Display a spectrum (C)
`getreg`	Get frequency limits of a specified region (C)
`region`	Divide spectrum into regions (C)
`z`	Add integral reset point at cursor position (C)

numrfch — Number of rf channels (P)

Description: Holds the number of rf channels available. The value is set with the Number of RF Channels label in the Spectrometer Configuration window. `numrfch` represents the hardware in the system. For example, if the last experiment used the second decoupler, `numrfch` is set to 2. The software then leaves the second decoupler on if it was on and leaves it off if it was off.

CAUTION: **Do not reset `numrfch` to eliminate the use of a channel. See the description of `dn2` and `dn3` for the method to disable channels.**

Values: The fifth channel can only be used with the deuterium decoupler channel.

See also: *VnmrJ Installation and Administration*

Related:

`config`	Display current configuration and possibly change it (M)
`dn2`	Nucleus for the second decoupler (P)
`dn3`	Nucleus for the third decoupler (P)
`dn4`	Nucleus for the fourth decoupler (P)

O

off	Make a parameter inactive (C)
on	Make a parameter active or test its state (C)
operator	Operator name (P)
operatorlogin	Sets workspace and parameters for the operator (M)
opx	Open shape definition file for Pbox (M)
oscoef	Digital filter coefficients for over sampling (P)
osfb	Digital filter bandwidth for over sampling (P)
osfilt	Over sampling filter for real-time DSP (P)
oslsfrq	Bandpass filter offset for over sampling (P)
overrange	Frequency synthesizer overrange (P)
oversamp	Over sampling factor for acquisition (P)
owner	Operating system account owner (P)

off — Make a parameter inactive (C)

Syntax: `off(parameter<,tree>)`

Description: Turns off an active parameter in any tree.

Arguments: `parameter` is the name of the parameter.

`tree` is type of parameter tree: `'current'`, `'global'`, `'processed'`, or `'systemglobal'`. The default is `'current'`. Refer to the `create` command for more information on the types of trees.

Examples:
```
off('gf')
off('n','global')
```

See also: *User Programming*

Related:

create	Create new parameter in a parameter tree (C)
on	Make a parameter active or test its state (C)
typeof	Return identifier for argument type (O)

on — Make a parameter active or test its state (C)

Syntax: `on(parameter<,tree>)<:$active>`

Description: Turns on an inactive parameter in any tree or tests if a parameter is active. Real variables (not strings) can be turned on and off. This can be done in any tree with the commands `on` and `off`, and by entering `name='y'` or `name='n'` to change the active flag for variables in the current tree only. The variable trees are `'current'`, `'global'`, `'processed'` and `'systemglobal'`. The default tree is `'current'`.

To test the active flag of a variable, use `on(...):$x`. This does not change the active flag of the variable, but sets `$x` to `1`, if the variable is active, or to `0`, if it is not active. If the variable does not exist, a value of `-1` is returned. Care should be taken if using the return value as a test for a conditional statement. For example, in the following fragment,

```
on('var1'):$e
if $e then
   write('line3','if statement is true with value of
```

```
%d',$e)
endif
```

the `write` command will be executed if `'var1'` is active, writing the message *if statement is true with value of 1* It will also be executed if `'var1'` does not exist, writing the message *if statement is true with value of -1*.

To only execute the `write` command if the variable is active, use something like the following:

```
on('var1'):$e
if ($e > 0.5) then
   write('line3','var1 is active')
endif
```

Arguments: `parameter` is the name of the parameter to make active or to test.

`tree` is type of parameter tree: `'current'`, `'global'`, `'processed'`, or `'systemglobal'`. The default is `'current'`. Refer to the `create` command for more information on the types of trees.

`$active` is 1 if the parameter is active, or is 0 if it is not active. Adding a return argument makes `on` conduct only a test of whether the specified parameter is active and does *not* turn on the parameter if it is inactive.

Examples:
```
on('lb'):$ison
on('gain','global')
```

See also: *User Programming*

Related:

`create`	Create new parameter in a parameter tree (C)
`off`	Make a parameter inactive (C)

`operator` Operator name (P)

Applicability: *VnmrJ Walkup*

Description: Specifies the operator name. It is set when an operator logs into the Walkup interface. Multiple operators may be defined for a single user using the VnmrJ Administrator interface.

Related:

`acct`	Writes records for operator login and logoff (M)
`operatorlogin`	Sets workspace and parameters for the operator (M)
`vnmr_accounting`	Open Accounting window (U)

`operatorlogin` Sets workspace and parameters for the operator (M)

Syntax: `operatorlogin operator email panellevel`

Description: Sets the panel display level and other parameters for an operator when the operator logs in. It also clears the new sample area in the study queue, and disables the command line if the operator has insufficient privileges. An operator may be logged in from the Switch operator dialog in the Utilities menu.

Related:

`acct`	Writes records for operator login and logoff (M)
`email`	Email address (P)
`operator`	Operator name (P)
`panellevel`	Display level for VnmrJ interface pages (P)
`vnmr_accounting`	Open Accounting window (U)

`opx` Open shape definition file for Pbox (M)

Syntax: `opx<(name<.ext>)>`

Description: Opens the pulse shape/pattern definition input file `shapelib/Pbox.inp` for the Pbox software and writes the file header.

Arguments: `name` is the name of the output shape file.
`ext` is a file name extension that specifies the file type.

Examples:
```
opx
opx('newfile.DEC')
```

Related:

Pbox	Pulse shaping software (U)

oscoef — Digital filter coefficients for over sampling (P)

Description: Specifies number of coefficients used in the digital filter. Enter `addpar('oversamp')` to add `oscoef` to the current experiment if `oscoef` does not exist. `addpar('oversamp')` creates digital filtering and oversampling parameters `def_osfilt`, `filtfile`, `oscoef`, `osfb`, `osfilt`, `oslsfrq`, and `oversamp`.

Values: The default is `7.5*oversamp` for inline DSP (`dsp='i'`). A larger number of coefficients gives a filter with sharper cutoffs; a smaller number gives a filter with more gradual cutoffs. The value of `oscoef` does not need to be changed when `oversamp` is changed because `oscoef` is automatically adjusted by VnmrJ to give filter cutoffs that are the same regardless of the value of `oversamp`.

The number of coefficients for real-time DSP (`dsp='r'`) is determined by the hardware and is not adjustable.

Related:

addpar	Add selected parameters to current experiment (M)
dsp	Type of DSP for data acquisition (P)
filtfile	File of FIR digital filter coefficients (P)
osfb	Digital filter bandwidth for oversampling (P)
oslsfrq	Bandpass filter offset for oversampling (P)
oversamp	Oversampling factor for acquisition (P)
paros	Create additional parameters used by oversampling (M)

osfb — Digital filter bandwidth for oversampling (P)

Description: Specifies bandwidth of the digital filter used for oversampling. If `osfb` does not exist in the current experiment, enter `addpar('oversamp')` to add it. `addpar('oversamp')` creates digital filtering and oversampling parameters `def_osfilt`, `filtfile`, `oscoef`, `osfilt`, `oslsfrq`, and `oversamp`.

Values: Number, in Hz. A value less than `sw/2` rejects frequencies at the edges of the spectrum; a value greater than `sw/2` aliases noise and signals at frequencies outside of ±`sw/2`.

`'n'` sets the bandwidth to `sw/2`.

Related:

addpar	Add selected parameters to current experiment (M)
def_osfilt	Default value of `osfilt` (P)
filtfile	File of FIR digital filter coefficients (P)
oscoef	Digital filter coefficients for oversampling (P)
osfilt	Oversampling filter for real-time DSP (P)
oslsfrq	Bandpass filter offset for oversampling (P)
oversamp	Oversampling factor for acquisition (P)

paros	Create additional parameters used by oversampling (M)
sw	Spectral width in directly detected dimension (P)

osfilt — Oversampling filter for real-time DSP (P)

Applicability: Systems with real-time DSP.

Description: Sets the type of real-time digital filter to be used on systems equipped with the real-time DSP hardware option. osfilt is normally set automatically by the software based on the user's global parameter def_osfilt, so that osfilt only needs to be changed if a particular experiment is to be run with a different digital filter than the default.

Values: 'a' or 'A' for the Analog*Plus*™ digital filter.

'b' or 'B' for the brickwall digital filter.

'' (null string) causes osfilt to be set to the value contained in the def_osfilt when an acquisition is initiated (with go, for example).

Related:		
	def_osfilt	Default value of osfilt (P)
	dsp	Type of DSP for data acquisition (P)

oslsfrq — Bandpass filter offset for oversampling (P)

Description: Selects a bandpass filter that is not centered about the transmitter frequency. In this way oslsfrq works much like lsfrq. If oslsfrq does not exist in the current experiment, add it with addpar('oversamp'), which creates digital filtering and oversampling parameters, the same as the paros macro.

Values: Number, in Hz. A positive value selects a region upfield from the transmitter frequency. A negative value selects a downfield region.

Related:		
	addpar	Add selected parameters to current experiment (M)
	def_osfilt	Default value of osfilt (P)
	filtfile	File of FIR digital filter coefficients (P)
	fsq	Frequency-shifted quadrature detection (P)
	lsfrq	Frequency shift of the fn spectrum in Hz (P)
	oscoef	Digital filter coefficients for oversampling (P)
	osfb	Digital filter bandwidth for oversampling (P)
	osfilt	Oversampling filter for real-time DSP (P)
	oversamp	Oversampling factor for acquisition (P)
	paros	Create additional parameters used for oversampling (M)

overrange — Frequency synthesizer overrange (P)

Applicability: Systems with optional version X46 of the PTS frequency synthesizer.

Description: Configures whether an rf channel has version X46 of the PTS frequency synthesizer. The value for each channel is set using the label Frequency Overrange in the Spectrometer Configuration window.

Values: Not Present, 10000 Hz, or 100000 Hz

Not Present indicates that this rf channel does not have the frequency overrange option.

10000 or 100000 indicate that this rf channel has the frequency overrange option. The **10000 Hz** or **100000 Hz** choices are determined by the letters *H*, *J*, or *K* found in the PTS Synthesizers model number. The normal value for overrange is 10000 Hz. If **Frequency Overrange** is set to 10000 Hz or 100000 Hz, the **Latching** value for that RF channel must also be set to **Present**.

When set to either 10000 Hz or 100000 Hz, overrange guarantees a range of phase-continuous frequency jumps of at least 10 kHz or 100 kHz in each jump direction.

See also: *VnmrJ Installation and Administration*

Related:

config	Display current configuration and possibly change it (M)
latch	Frequency synthesizer latching (P)

oversamp — Oversampling factor for acquisition (P)

Description: Specifies the oversampling factor for the acquisition. With inline digital filtering (dsp='i'), np*oversamp data points are acquired at a rate of sw*oversamp. The data is then transferred to the host computer, digitally filtered, and downsampled to give np points and a spectral width of sw.

With real-time digital filtering (dsp='r'), the oversampling, digital filtering, and down sampling all occur as each data point is collected, so that only np data points are ever stored in the acquisition computer memory and subsequently transferred to the host computer.

If oversamp does not exist in the current experiment, enter the command addpar('oversamp') to add it. addpar('oversamp') creates digital filtering and oversampling parameters def_osfilt, filtfile, oscoef, osfb, osfilt, oslsfrq, and oversamp.

If oversamp is set to a number, then that number represents the amount of oversampling to apply when collecting the data. The oversamp value is automatically calculated whenever sw is changed, provided oversamp is not set to 'n'. That is the distinction between oversamp='n' and oversamp=1. In both cases, no oversampling will be used. This occurs, for example, if the sw parameter is greater than half the maximum spectral width. However, if sw is reduced so that oversampling is possible, then if oversamp is set to 'n', oversamp will remain set to 'n' and oversampling will not occur. On the other hand, if oversamp is set to 1, then oversamp is recalculated and oversampling will occur. Therefore, the oversamp parameter accurately represents whether oversampling is performed for a data set. When oversamp is automatically determined based on a change to sw, it is set to the maximum possible oversampling factor. The value of oversamp can be manually reset.

Note that setting oversamp greater than 1 means oversampling is selected for the experiment. However, if the oversampling facility is not present in the system (i.e., dsp='n'), then the oversamp parameter is automatically reset to 1, indicating that no oversampling will be performed.

Two other experiment local parameters reflect whether DSP is used during the acquisition of a data set:

- fb is set to Not Active if DSP is used.
- oscoef reflects whether real-time (dsp='r') or inline (dsp='i') DSP was used. If real-time, oscoef is set to Not Active. If inline, oscoef is set to the value used by the inline algorithm.

Values: Number less than or equal to 68. For inline DSP, sw*oversamp and np*oversamp are limited by the values in the following table:

Maximum sw*oversamp	*Maximum* np*oversamp
500 kHz	2M
100 kHz	128K

The maximum np*oversamp is given for double precision data (dp='y'). For dp='n', multiply this value by 2.

'n' causes normal acquisition to be done without digital filtering.

Related:	addpar	Add selected parameters to current experiment (M)
	def_osfilt	Default value of osfilt parameter (P)
	dp	Double precision (P)
	dsp	Type of DSP for data acquisition (P)
	fb	Filter bandwidth (P)
	filtfile	File of FIR digital filter coefficients (P)
	fsq	Frequency-shifted quadrature detection (P)
	np	Number of data points (P)
	oscoef	Digital filter coefficients for oversampling (P)
	osfb	Digital filter bandwidth for oversampling (P
	osfilt	Oversampling filter for real-time DSP (P)
	oslsfrq	Bandpass filter offset for oversampling (P)
	paros	Create additional parameters used by oversampling (M)
	sw	Spectral width in directly detected dimension (P)

owner Operating system account owner (P)

Description: Set to the Unix or Linux account owner. It is set when VnmrJ is started.

P

p1	Enter pulse width for p1 in degrees (C)
p1	First pulse width (P)
p2pul	Set up sequence for PFG testing (M)
p31	Automated phosphorus acquisition (M)
p31p	Process 1D phosphorus spectra (M)
pa	Set phase angle mode in directly detected dimension (C)
pa1	Set phase angle mode in 1st indirectly detected dimension (C)
pacosy	Plot automatic COSY analysis (C)
pad	Preacquisition delay (P)
padept	Perform adept analysis and plot resulting spectra (C)
page	Submit plot and change plotter page (C)
page	Name of page (P)
panellevel	Display level for VnmrJ interface pages (P)
pap	Plot out “all” parameters (C)
par2d	Create 2D acquisition, processing, and display parameters (M)
par3d	Create 3D acquisition, processing, and display parameters (M)
par3rf	Get display templates for 3rd rf channel parameters (M)
par4d	Create 4D acquisition parameters (M)
paramedit	Edit a parameter and its attributes with user-selected editor (C)
paramvi	Edit a parameter and its attributes with vi editor (M)
pards	Create additional parameters used by down sampling (M)
parfidss	Create parameters for time-domain solvent subtraction (M)
parfix	Update parameter sets (M)
parlc	Create parameters for LC-NMR experiments (M)
parll2d	Create parameters for 2D peak picking (M)
parlp	Create parameters for linear prediction (M)
parmax	Parameter maximum values (P)
parmin	Parameter minimum values (P)
paros	Create additional parameters used by over sampling (M)
parstep	Parameter step size values (P)
parversion	Version of parameter set (P)
path3d	Path to currently displayed 2D planes from a 3D data set (P)
paxis	Plot horizontal LC axis (M)
Pbox	Pulse shaping software (U)
pbox_bw	Define excitation band (M)
pbox_bws	Define excitation band for solvent suppression (notch) pulses (M)
pbox_dmf	Extract dmf value from pbox.cal or Pbox shape file (M)
pbox_dres	Extract dres value from pbox.cal or Pbox shape file (M)
pbox_name	Extract name of last shape generated by Pbox from pbox.cal (M)
pbox_pw	Extract pulse length from pbox.cal or Pbox shape file (M)
pbox_pwr	Extract power level from Pbox.cal or Pbox shape file (M)
pbox_pwrf	Extract fine power level from pbox.cal or Pbox shape file (M)
pboxget	Extract Pbox calibration data (M)

P

pboxpar	Add parameter definition to the Pbox.inp file (M)
pboxrst	Reset temporary Pbox variables (M)
pboxunits	Converts to Pbox default units (M)
pcon	Plot contours on a plotter (C)
pcss	Calculate and show proton chemical shifts spectrum (M)
peak	Find tallest peak in specified region (C)
peak2d	Return information about maximum in 2D data (C)
pen	Select a pen or color for drawing (C)
pexpl	Plot exponential or polynomial curves (C)
pexpladd	Add another diffusion analysis to current plot (M)
pfgon	Pulsed field gradient amplifiers on/off control (P)
pfww	Plot FIDs in whitewash mode (C)
pge	Convert parameter set to PGE pulse sequence (M)
pge_calib	Calibrate gradient strengths for PGE pulse sequence (M)
pge_data	Extract data from single element of PGE pulse sequence (M)
pge_output	Output results from PGE pulse sequence (M)
pge_process	Automated processing of data from PGE pulse sequence (M)
pge_results	Calculate diffusion constant for integral region (M)
pge_setup	Set up gradient control parameters for PGE pulse sequence (M)
ph	Set phased mode in directly detected dimension (C)
ph1	Set phased mode in 1st indirectly detected dimension (C)
ph2	Set phased mode in 2nd indirectly detected dimension (C)
phase	Change frequency-independent phase rp (M)
phase	Phase selection (P)
phase1	Phase of first pulse (P)
phase2	Phase selection for 3D acquisition (P)
phase3	Phase selection for 4D acquisition (P)
phasing	Control update region during interactive phasing (P)
phfid	Zero-order phasing constant for the np FID (P)
phfid1	Zero-order phasing constant for ni interferogram (P)
phfid2	Zero-order phasing constant for ni2 interferogram (P)
Phosphorus	Set up parameters for ^{31}P experiment (M)
pi3ssbsq	Set up pi/3 shifted sinebell-squared window function (M)
pi4ssbsq	Set up pi/4 shifted sinebell-squared window function (M)
pin	Pneumatics Router Interlock ((P)
pintvast	Plots of integral regions (M)
pir	Plot integral amplitudes below spectrum (C)
pirn	Plot normalized integral amplitudes below spectrum (M)
piv	Plot integral amplitudes below spectrum (M)
pivn	Plot normalized integral amplitudes below spectrum (M)
pl	Plot spectra (C)
pl2d	Plot 2D spectra in whitewash mode (C)
plt2Darg	Plot 2D arguments (P)
plane	Currently displayed 3D plane type (P)
plapt	Plot APT-type spectra automatically (M)
plarray	Plotting macro for arrayed 1D spectra (M)
plate_glue	Define a glue order for plotting and display (U)

plc	Plot a carbon spectrum (M)
plcosy	Plot COSY- and NOESY-type spectra automatically (M)
pldept	Plot DEPT data, edited or unedited (M)
plfid	Plot FIDs (C)
plfit	Plot deconvolution analysis (M)
plgrid	Plot a grid on a 2D plot (M)
plh	Plot proton spectrum (M)
plhet2dj	Plot heteronuclear J-resolved 2D spectra automatically (M)
plhom2dj	Plot homonuclear J-resolved 2D spectra automatically (M)
plhxcor	Plot X,H-correlation 2D spectrum (M)
pll	Plot a line list (M)
pll2d	Plot results of 2D peak picking (C)
plockport	Port number to use to lock out multiple ProTune processes (P)
plot	Automatically plot spectra (M)
plot1d	Plotting macro for simple (non-arrayed) 1D spectra (M)
plot2D	Plot 2D spectra (M)
plotfile	Plot to a file (M)
plothiresprep	High resolution plot output preparation (M)
plotmanual	Plot manually (M)
plotlogo	Plots a logo (M)
plotside	Plot spectrum on side (M)
plotter	Plotter device (P)
plottop	Plot spectrum on top (M)
plottopside	Plot spectrum on top and side (M)
plp	Plot phosphorus spectrum (M)
plplanes	Plot a series of 3D planes (M)
plt2Darg	Plot 2D arguments (P)
pltext	Plot text file (M)
pltmod	Plotter display mode (P)
plvast	Plot VAST data in a stacked 1D-NMR matrix format (M)
plvast2d	Plot VAST data in a stacked pseudo-2D format (M)
plww	Plot spectra in whitewash mode (C)
pmode	Processing mode for 2D data (P)
poly0	Display mean of the data in regression.inp file (M)
pp	Decoupler pulse length (P)
ppa	Plot a parameter list in plain English (M)
ppcal	Proton decoupler pulse calibration (M)
ppf	Plot peak frequencies over spectrum (C)
pph	Print pulse header (M)
ppmm	Resolution on printers and plotters (P)
pprofile	Plot pulse excitation profile (M)
pps	Plot pulse sequence (C)
prealfa	Specify a delay for longer ring down (P)
prep	Run prepare acquisition macro (M)
Presat	Set up parameters for presat ^{1}H experiment (M)
prescan	Study queue prescan (P)
prevpl	Display the previous 3D plane (M)

P

prescan_CoilTable	Read or update the CoilTable File (M)
prescan_tn	Return tn string for a given atomic number (M)
printer	Printer device (P)
printfile	Path to the print-to-file image (P)
printformat	Format of saved-to-file image (P)
printlayout	Layout of printed image (P)
printoff	Stop sending text to printer and start print operation (C)
printon	Direct text output to printer (C)
printregion	Screen region to be printed (P)
printsize	Size of printed image (P)
printsend	Defines where image will print (P)
probe	Probe type (P)
probeConnect	Specify which nucleus can be acquired on each RF channel (P)
Probe_edit	Edit probe for specific nucleus (U)
probe_edit	Edit probe for specific nucleus (M)
probe_protection	Probe protection control (P)
proc	Type of processing on np FID (P)
proc1	Type of processing on ni interferogram (P)
proc1d	Processing macro for simple (non-arrayed) 1D spectra (M)
proc2	Type of processing on ni2 interferogram (P)
proc2d	Process 2D spectra (M)
procarray	Process arrayed 1D spectra (M)
process	Generic automatic processing (M)
procplot	Automatically process FIDs (M)
profile	Set up pulse sequence for gradient calibration (M)
proj	Project 2D data (C)
Proton	Set up parameters for ^{1}H experiment (M)
protune	Macro to start ProTune (M)
protune	Shell script to start ProTune operation (U)
protunegui	Macro to start ProTune in graphical user interface (M)
prune	Prune extra parameters from current tree (C)
pscale	Plot scale below spectrum or FID (C)
pseudo	Set default parameters for pseudo-echo weighting (M)
psg	Display pulse sequence generation errors (M)
psggen	Compile a user PSG object library (M,U)
psgset	Set up parameters for various pulse sequences (M)
psgupdateon	Enable update of acquisition parameters (C)
psgupdateoff	Prevent update of acquisition parameters (C)
pshape	Plot pulse shape or modulation pattern (M)
pshapef	Plot the last created pulse shape (M)
pshr	PostScript High Resolution plotting control (P)
pslabel	Pulse sequence label (P)
pslw	PostScript Line Width control (P)
pssl	Plot Arrayed Numbers (C)
ptext	Print out a text file (M)
ptspec3d	Region-selective 3D processing (P)
ptsval	PTS frequency synthesizer value (P)

pulseinfo	Shaped pulse information for calibration (M)
pulsetool	RF pulse shape analysis (U)
purge	Remove macro from memory (C)
puttxt	Put text file into a data file (C)
putwave	Write a wave into Pbox.inp file (M)
pw	Enter pulse width pw in degrees (C)
pw	Pulse width (P)
pw90	90° pulse width (P)
pwd	Display current working directory (C)
pwr	Set power mode in directly detected dimension (C)
pwr1	Set power mode in 1st indirectly detected dimension (C)
pwr2	Set power mode in 2nd indirectly detected dimension (C)
pwsadj	Adjust pulse interval time (M)
pwxcal	Decoupler pulse calibration (M)
pxbss	Bloch-Siegert shift correction during Pbox pulse generation (P)
pxrep	Flag to set the level of Pbox reports (P)
pxset	Assign Pbox calibration data to experimental parameters (M)
pxshape	Generates a single-band shape file (M)
Pxsim	Simulate Bloch profile for a shaped pulse (U)
Pxspy	Create shape definition using Fourier coefficients (U)

p1 — Enter pulse width for p1 in degrees (C)

Syntax: `p1(flip_angle<,90_pulse_width>)`

Description: Calculates the flip time, in µs, given a desired flip angle and the 90° pulse. The value is entered into the pulse width parameter `p1`.

Arguments: `flip_angle` is the desired flip angle, in degrees.

`90_pulse_width` is the 90° pulse, in µs. The default is the value of parameter `pw90` if it exists.

Examples:
```
p1(30)
p1(90,12.8)
```

See also: *NMR Spectroscopy User Guide*

Related:

ernst	Calculate the Ernst angle pulse (C)
p1	First pulse width (P)
pw90	90° pulse width (P)

p1 — First pulse width (P)

Description: Length of first pulse in the standard two-pulse sequence.

Values: 0, 0.2 µs to 150,000 µs, in 0.1 µs steps
0.1 µs to 8190 sec, smallest value possible is 0.1 µs, finest increment possible is 12.5 ns.

See also: *NMR Spectroscopy User Guide*

Related:

p1	Enter pulse width *p1* in degrees (C)

p1pat — Shape of excitation pulse (P)

Applicability: Systems with imaging capabilities.

Description: Specifies the shape of pulse p1 when used in imaging experiments.

Values: 'hard', 'sinc', 'gauss', 'sech', 'sine', or any shape resident in the system pulse shape library or libraries.

See also: *VnmrJ Imaging NMR*

Related:

p1	First pulse width (P)
pwpat	Shape of refocusing pulse (P)

p2pul — Set up sequence for PFG testing (M)

Applicability: Systems with the pulsed field gradient (PFG) module. *This sequence is not for NMR applications.*

Description: Sets up the PFG two-pulse sequence, a system checkout sequence for PFG installation. Several modes are controlled by the cmd parameter.

- cmd='twinkle' sequentially addresses DACs 0 through 4. On the gradient channel interface, lights become a slow binary counter.
- cmd='pulse' makes a pulse of value gzlvl1 for a time gt1.
- cmd='bipulse' makes a pulse of value gzlvl1 for a time gt1 followed by a pulse of value –gzlvl1 for a time gzlvl1.

For other modes, see the PFG installation manual.

See also: *Pulsed Field Gradient Modules Installation*

p31 — Automated phosphorus acquisition (M)

Syntax: p31<(solvent)>

Description: Prepares parameters for automatically acquiring a standard ^{31}P spectrum. The parameter wexp is set to 'procplot' for standard processing. If p31 is used as the command for automation via the enter command, then the macro au is supplied automatically and should not be entered on the MACRO line of the enter program. However, it is possible to customize the standard p31 macro on the MACRO line by following it with additional commands and parameters. For example, p31 nt=1 will use the standard p31 setup but with only one transient.

Arguments: solvent is the name of the solvent. The default is CDCl3. In automation mode, the solvent is supplied by the enter program.

Examples:

```
p31
p31('DMSO')
```

See also: *NMR Spectroscopy User Guide*

Related:

au	Submit experiment to acquisition and process data (M)
enter	Enter sample information for automation run (C)
p31p	Process 1D phosphorus spectra (M)
proc1d	Processing macro for simple, non-arrayed 1D spectra (M)
procplot	Automatically process FIDs (M)
wexp	When experiment completes (P)

p31p — Process 1D phosphorus spectra (M)

Syntax: p31p

Description: Processes non-arrayed 1D ^{31}P spectra using a set of standard macros. p31p is called by the proc1d macro but can also be used directly. Fully automatic processing (up to a point where a spectrum could be plotted) is provided:

Fourier transformation (using preset weighting functions), automatic phasing (aphx macro), automatic integration (integrate macro, if required only), vertical scale adjustment (vsadjc macro), avoiding excessive noise (noislm macro), threshold adjustment (thadj macro), and referencing to the TMS signal, if present (tmsref macro).

See also: *NMR Spectroscopy User Guide*

Related:

aphx	Perform and check automatic phasing (M)
integrate	Automatically integrate 1D spectrum (M)
noislm	Avoids excessive noise (M)
p31	Automated phosphorus acquisition (M)
proc1d	Automatically process non-arrayed 1D fids (M)
thadj	Adjust threshold (M)
tmsref	Reference spectrum to TMS line (M)
vsadjc	Adjust vertical scale for carbon spectra (M)

pa — Set phase angle mode in directly detected dimension (C)

Description: Selects the phase angle mode by setting the parameter dmg='pa'. In the *phase angle display mode*, each real point in the displayed spectrum is calculated from the phase angle of the real and imaginary points comprising each respective complex data point. The phase angle also takes into account the phase parameters rp and lp.

For 2D data, if pmode='partial' or pmode='' (two single quotes with no space in between), pa has an effect on the data prior to the second Fourier transform. If pmode='full', pa acts in concert with the commands pa1, av1, pwr1, or ph1 to yield the resultant contour display for the 2D data.

See also: *NMR Spectroscopy User Guide*

Related:

av	Set abs. value mode in directly detected dimension (C)
dmg	Data display mode in directly detected dimension (P)
ft	Fourier transform 1D data (C)
ft1d	Fourier transform along f_2 dimension (C)
ft2d	Fourier transform 2D data (C)
lp	First-order phase in directly detected dimension (P)
pa1	Set phase angle mode in 1st indirectly detected dimension (C)
ph	Set phased mode in directly detected dimension (C)
pmode	Processing mode for 2D data (P)
pwr	Set power mode in directly detected dimension (C)
pwr1	Set power mode in 1st indirectly detected dimension (C)
rp	Zero-order phase in directly detected dimension (P)
wft	Weight and Fourier transform 1D data (C)
wft1d	Weight and Fourier transform f_2 of 2D data (M)
wft2d	Weight and Fourier transform 2D data (M)

pa1 — Set phase angle mode in 1st indirectly detected dimension (C)

Description: Selects the phase angle spectra display mode along the first indirectly detected dimension by setting the parameter dmg1 to the string value 'pa1'. If the parameter dmg1 does not exist, pa1 will create it and set it to 'pa1'.

In the phase angle mode, each real point in the displayed trace is calculated from the phase angle of the real and imaginary points comprising each respective complex data point. For hypercomplex data, the phase angle uses the real-real and imaginary-real points from each respective hypercomplex data point. The phase angle also takes into account the phase parameters rp1 and lp1.

The pa1 command is only needed if mixed-mode display is desired. If the parameter dmg1 does not exist or is set to the null string, the display mode along the first indirectly detected dimension defaults to the display mode of the directly detected dimension (characterized by the parameter dmg). For the contour display of multidimensional data, the result of pa1 is the same as for traces provided that pmode='partial' or pmode=''.

See also: *NMR Spectroscopy User Guides*

Related:

av1	Set abs. value mode in 1st indirectly detected dimension (C)
dmg1	Data display mode in 1st indirectly detected dimension (P)
lp1	First-order phase in 1st indirectly detected dimension (P)
pa	Set phase angle mode in directly detected dimension (C)
ph1	Set phased mode in 1st indirectly detected dimension (C)
pmode	Processing mode for 2D data (P)
pwr1	Set power mode in 1st indirectly detected dimension (C)
rp1	Zero-order phase in 1st indirectly detected dimension (P)

pacosy — Plot automatic COSY analysis (C)

Description: Automatically analyzes and plots a COSY data set with fn=fn1 and sw=sw1. Symmetrization of the data with the command foldt is recommended, but not required. First, select a proper threshold and perform a 2D line listing with the command ll2d. Next, plot the 2D data with the contour plot command pcon; leaving enough room at the left side of the plot for the connectivity table. Then, pacosy will analyze the data and plot the connectivities on the plotter. pacosy gets its input from the file ll2d.out in the current experiment directory. The command acosy performs the same analysis and displays the connectivities on the screen.

See also: *NMR Spectroscopy User Guide*

Related:

acosy	Automatic analysis of COSY data (C)
fn	Fourier number in directly detected dimension (P)
fn1	Fourier number in 1st indirectly detected dimension (P)
foldt	Fold COSY-like spectrum along diagonal axis (C)
hcosy	Automated proton and COSY acquisition (M)
ll2d	Automatic and interactive 2D peak picking (C)
pcon	Plot contours on plotter (C)
relayh	Set up parameters for COSY pulse sequence (M)
sw	Spectral width in directly detected dimension (P)
sw1	Spectral width in 1st indirectly detected dimension (P)

pad — Preacquisition delay (P)

Description: Each NMR experiment starts with a single delay time equal to pad over and above the delay d1 that occurs before each transient. Normally, pad is set to a small, nominal time (0.5 seconds) to allow any hardware changes that may be required at the start of the acquisition to “settle in.” During experiments in which the temperature is changed, the acquisition starts pad seconds after the temperature regulation system comes to regulation. Since the sample temperature does not actually come to equilibrium for some time after that, it is generally desirable to increase pad to perhaps 300 seconds. This is especially true when running experiments involving arrays of temperatures. The pad parameter is most useful for running kinetics experiments. For example, pad=0,3600,3600,3600,3600 will run an experiment immediately when go is typed (pad=0), then wait an hour (3600 seconds), run the second experiment, etc.

Values: 0,0.1 µs to 8190 sec in 12.5 ns steps
0,0.2 µs to 150,000 sec in 0.1 µs steps.

See also: *NMR Spectroscopy User Guide; VnmrJ Walkup*

Related:

d1	First delay (P)
go	Submit experiment to acquisition (C)

padept — Perform adept analysis and plot resulting spectra (C)

Syntax: `padept<(<'noll'><,'coef'><,'theory'>)>`

Description: Performs the adept analysis and plots the resulting spectra with a scale and the assigned line listing. Leave enough space at the left end of the display for the line list.

Arguments: The following arguments can be supplied in any order:

'noll' is a keyword that specifies no line listing.

'coef' is a keyword that causes the combination coefficients to be printed.

'theory' is a keyword that causes the theoretical coefficients rather than optimized coefficients to be used.

Examples:
```
padept('noll','coef')
```

See also: *NMR Spectroscopy User Guide*

Related:

adept	Automatic DEPT analysis and spectrum editing (C)
autodept	Automated complete analysis of DEPT data (M)
cdept	Automated carbon and DEPT acquisition (C)
Dept	Set up parameters for DEPT experiment
deptproc	Process DEPT data (M)
hcdept	Automated proton, carbon, and DEPT acquisition (C)
pldept	Plot DEPT data, edited or unedited (M)

page — Submit plot and change plotter page (C)

Syntax: `page<(number_pages<,'clear'|file>)>`

Description: Submits the current plotter file, which has been created by all previous plotter commands, and changes the paper after the plot has been completed. Actual plotting is controlled by the vnmrplot script in the bin subdirectory of the system directory. The page command can also clear the current plotter file or save the data to a specified file name.

Arguments: number_pages is the number of pages to move the plotter forward. The default is 1. If number_pages is 0, page submits the plot but does not change the paper.

'clear' is a keyword to clear the plot made thus far; that is, clear the data in the current plotter file.

file is the name of a file to save the plot for import into a document. If the file already exists, it is overwritten.

Examples:
```
page
page(0)
page('clear')
page('myplotfile')
```

See also: *NMR Spectroscopy User Guide*

Related:

vnmrplot	Plot files (U)

P

page — Name of page (P)

Description: Specifies the page of a sample. It is saved with a study.

Related:

cqsavestudy	Macro to save study queue parameters (M)
notebook	Notebook name (P)
samplename	Sample name (P)
studypar	Study parameters (P)

panellevel — Display level for VnmrJ interface pages (P)

Description: Determines which VnmrJ interface pages are available under the tabs in the parameter page area. The higher the number, the more pages are available. The only time panellevel is changed is during the login process of an operator in the Walkup interface. For the Walkup interface, the value is set by the VnmrJ Administrator (default is 10).

Values: **0-9** — shows the minimum number of pages.

No shim, lock, or processing, and minimal parameter control is available. This may be used for routine automation users.

10-29 — typical for a basic Walkup user.

Shim and lock are available only if there is a sample changer. Basic processing is available. Pages are not fully populated, allowing control of a few basic parameters.

30-100 — typical for the system owner.

All pages are available and fully populated.

See also: VnmrJ Installation and Administration

Related:

operator	Operator name (P)
operatorlogin	Sets workspace and parameters for the operator (M)

pap — Plot out “all” parameters (C)

Syntax: `pap<(<template><,x><,y><,character_size>)>`

Description: Plots a parameter list containing “all” parameter names and values.

Arguments: `template` is the name of a template that controls the display. The default is the string parameter `ap`, which can be modified using `paramvi('ap')`. See the manual *User Programming* for rules on building a template.

`x` is the starting position in the x direction of the plot on the paper, in mm. The default is a preset value.

`y` is the starting position in the y direction of the plot on the paper, in mm. If `y` is specified, the `x` position must be also. The default is a preset value.

`character_size` is the character size of the list and is specified as a multiplier. The default is 0.70 (not available on all plotters or printers acting as plotters).

Examples:

```
pap
pap(wcmax-40)
pap(10,wc2max*.9)
pap('newpap',wcmax-50,100,1.4)
```

See also: *NMR Spectroscopy User Guide*, *User Programming*

Related:

ap	Print out “all” parameters (C)
ap	“All” parameters display control (P)
hpa	Plot parameters on special preprinted chart paper (C)

paramvi	Edit a variable and its attributes using vi text editor (M)
ppa	Plot a parameter list in “English” (M)

par2d — Create 2D acquisition, processing, and display parameters (M)

Description: Creates the acquisition parameters ni, sw1, and phase, which can be used to acquire a 2D data set. par2d also creates any missing processing and display parameters for the ni (or second) dimension, including f1coef, reffrq1, refpos1, and refsource1. The par2d macro is functionally the same as addpar('2d').

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
f1coef	Coefficient to construct F1 interferogram (P)
ni	Number of increments in 1st indirectly detected dimension (P)
phase	Phase selection (P)
reffrq1	Reference frequency of reference line in 1st indirect dimension (P)
refpos1	Position of reference line in 1st indirect dimension (P)
refsource1	Center frequency in 1st indirect dimension (P)
set2d	General setup for 2D experiments (M)
sw1	Spectral width in 1st indirectly detected dimension (P)

par3d — Create 3D acquisition, processing, and display parameters (M)

Description: Creates the acquisition parameters ni2, sw2, d3, and phase2 that can be used to acquire a 3D data set. par3d also creates any missing processing or display parameters for the ni2 (or third) dimension, including f2coef, fiddc3d, specdc3d, and ptspec3d. The par3d macro is functionally the same as addpar('3d').

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
d3	Incremented delay in 2nd indirectly detected dimension (P)
f2coef	Coefficient to construct F2 interferogram (P)
fiddc3d	3D time-domain dc correction (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
phase2	Phase selection for 3D acquisition (P)
ptspec3d	Region-selective 3D processing (P)
specdc3d	3D spectral dc correction (P)
sw2	Spectral width in 2nd indirectly detected dimension (P)

par3rf — Get display templates for 3rd rf channel parameters (M)

Applicability: Systems with a second decoupler.

Description: Retrieves the dg2 and modified ap display templates from the parameter set s2pul3rf in the system parlib directory. These two templates support the display of second decoupler acquisition parameters and 3D acquisition and processing parameters.

See also: *User Programming*

Related:

ap	“All” parameters display control (P)
dg2	Control dg2 parameter group display (P)

par4d — Create 4D acquisition parameters (M)

Applicability: Systems with a third decoupler.

Description: Creates the acquisition parameters ni3, sw3, d4, and phase3 that can be used to acquire a 4D data set. The par4d macro is functionally the same as addpar('4d').

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
d4	Incremented delay for 3rd indirectly detected dimension (P)
ni3	Number of increments in 3rd indirectly detected dimension (P)
phase3	Phase selection for 4D acquisition (P)
sw3	Spectral width in 3rd indirectly detected dimension (P)

paramedit — Edit a parameter and its attributes with user-selected editor (C)

Syntax: paramedit(parameter<,tree>)

Description: Opens a parameter file for editing with a user-selected text editor. The default editor is vi. If vi is used as the editor, paramedit is functionally the same as the paramvi command. To select another editor, set the UNIX environmental variable vnmreditor to the editor name (change .login line setenv vnmreditor old_editor to become setenv vnmreditor new_editor *(e.g.,* setenv vnmreditor emacs*)* and make sure a script with the prefix vnmr_ followed by the name of the editor is placed in the bin subdirectory of the system directory (e.g., vnmr_emacs). The script file makes adjustments for the type of graphic interface in use.

Scripts in the software release include vnmr_vi and vnmr_textedit. To create other scripts, refer to the vnmr_vi script for non-window editor interfaces and to vnmr_textedit for window-based editor interfaces. The vnmreditor variable must be set before starting VnmrJ.

Arguments: parameter is the name of the parameter file to be edited.

tree is a keyword for one of the parameter trees 'current', 'global', or 'processed'. The default is 'current'.

Examples:
```
paramedit('ap')
paramedit('b','global')
```

See also: *NMR Spectroscopy User Guide; User Programming*

Related:

paramvi	Edit a parameter and its attributes with vi editor (M)
vi	Edit text file with the vi text editor (C)

paramvi — Edit a parameter and its attributes with vi editor (M)

Syntax: paramvi(parameter<,tree>)

Description: Opens a parameter file for editing using the UNIX vi text editor. The parameter file contains various attributes of the parameter in a format documented in the manual *User Programming*. Be sure you understand the format before modifying the parameter because if an error in the format is made, the parameter will not load. When the editor is exited, the modified parameter is reloaded into the system.

Arguments: parameter is the name of the parameter file to be edited.

tree is a keyword for one of the parameter trees 'current', 'global', or 'processed'. The default is 'current'.

Examples:
```
paramvi('ap')
paramvi('b','global')
```

See also: *NMR Spectroscopy User Guide, User Programming*

Related:

create	Create new parameter in a parameter tree (C)
destroy	Destroy a parameter (C)
destroygroup	Destroy parameters of a group in a tree (C)
display	Display parameters and their attributes (C)
fread	Read parameters from file and load them into a tree (C)
fsave	Save parameters from a tree to a file (C)
groupcopy	Copy parameters of group from one tree to another (C)
paramedit	Edit a parameter and its attributes with user-selected editor (C)
prune	Prune extra parameters from current tree (C)
setgroup	Set group of a parameter in a tree (C)
setlimit	Set limits of a parameter in a tree (C)
setprotect	Set protection mode of a parameter (C)
vi	Edit text file with the vi text editor (C)

pards — Create additional parameters used by downsampling (M)

Description: Creates the parameters downsamp, dscoef, dsfb, dslsfrq, and filtfile necessary for digital filtering and downsampling. The pards macro is functionally the same as addpar('downsamp').

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to current experiment (M)
downsamp	Downsampling factor applied after digital filtering (P)
dscoef	Digital filter coefficients for downsampling (P)
dsfb	Digital filter bandwidth for downsampling (P)
dslsfrq	Bandpass filter offset for downsampling (P)
filtfile	File of FIR digital filter coefficients (P)
movedssw	Set downsampling parameters for selected spectral region (M)

parfidss — Create parameters for time-domain solvent subtraction (M)

Description: Creates solvent subtraction parameters ssfilter, sslsfrq, ssntaps, and ssorder. Entering addpar('ss') is functionally equivalent to parfidss.

In a 1D transform, subtraction of the zero-frequency component from the time-domain data, usually in the context of solvent subtraction, is selected by setting ssorder and ssfilter to desired values and entering wft:

- The zfs (zero-frequency suppression) option is selected if both ssfilter and ssorder are set to a value other than “Not Used.”
- The lfs (low-frequency suppression) option is selected if ssfilter is set to a value other than “Not Used” and ssorder is set to “Not Used.”
- The zfs and lfs options are both turned off if ssfilter is set to “Not Used.”

The zfs option leads to the following series of processing events: (1) the raw FID is frequency-shifted by sslsfrq Hz, (2) the raw FID is subjected to a low- pass digital filter, (3) the filtered FID is fit to a polynomial of order ssorder, (4) the polynomial function is subtracted from the raw FID, and (5) the resulting FID is frequency-shifted by –sslsfrq Hz.

The lfs option does not include a polynomial fit (step 3 of the zfs option), which leads to the following series of processing events: (1) the raw FID is frequency-shifted by sslsfrq Hz, (2) the raw FID is subjected to a low-pass digital filter, (3) the filtered FID is directly subtracted from the raw FID, (4) the resulting FID is frequency-shifted by –sslsfrq Hz.

The quality of filtering with zfs diminishes rapidly as the solvent peak moves off the exact center of the digital filter. It may be necessary to adjust lsfrq or sslsfrq to move the solvent peak to within ± 0.2 Hz of the center of the filter to obtain optimal solvent suppression. The lfs option is less sensitive to small offsets, but typically removes or distorts peaks near to the solvent peak.

In a 2D transform, solvent correction to the t_2 FIDs is invoked in the same manner with the ft1d, ft2d, wft1d, and wft2d commands and with the ft2da, ft1da, wft2da, and wft1da macros.

In a 3D transform, solvent suppression works on t_3 FIDs of 3D spectra just like in the 1D and 2D cases.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
ft	Fourier transform 1D data (C)
ft1d	Fourier transform along f_2 dimension (C)
ft2d	Fourier transform 2D data (C)
ft3d	Perform a 3D Fourier transform on a 3D FID data set (M,U)
lsfrq	Frequency shift of the fn spectrum in Hz (P)
ntype3d	N-type peak selection in f_1 or f_2 (P)
ssfilter	Full bandwidth of digital filter to yield a filtered FID (P)
sslsfrq	Center of solvent-suppressed region of spectrum (P)
ssorder	Order of polynomial to fit digitally filtered FID (P)
ssntaps	Number of coefficients to be used in the digital filter (P)
wft	Weight and Fourier transform 1D data (C)

parfix — Update parameter sets (M)

Description: Corrects upper limits, lower limits, and step sizes of a number of parameters in the current experiment. In addition, the template parameter dgs is updated. This is automatically done via the macro fixpar if the parameter parversion is less than 4.3. parfix is used by the macro updatepars to correct saved data. This macro has been applied to all parameters as of VNMR version 4.3 and should be run on older parameter sets (e.g., rtp('pars') svp('pars') update a parameter set named pars).

See also: *NMR Spectroscopy User Guide*

Related:

ap	"All" parameters display control (P)
dgs	Control dgs parameter group display (P)
fixpar	Correct parameter characteristics in experiment (M)
parversion	Version of parameter set (P)
updatepars	Update all parameter sets saved in a directory (M)

parlc — Create parameters for LC-NMR experiments (M)

Applicability: Systems with LC-NMR accessory.

Description: Creates the following parameters used for a variety of LC-NMR experiments: curscan, dtrig, inject, ntrig, and savefile. The parlc macro also creates ni and sw1 (if they don't exist) for use in isocratic runs. Finally, it creates a display parameter dglc, so that the dg('dglc') command (or the equivalent macro dglc) can be used to display all the LC-related parameters.

Note that parlc can be used without worrying about losing existing values or attributes; if the parameters already exist, they are left untouched.

See also: *NMR Spectroscopy User Guide*

Related:

curscan	Scan currently in progress (P)
dglc	Control LC-NMR parameter display (P)

dtrig	Delay to wait for another trigger or acquire a spectrum (P)
inject	Trigger the injection of a sample (P)
ntrig	Number of trigger signals to wait before acquisition (P)
savefile	Base file name for saving FIDs or data sets (P)

parll2d — Create parameters for 2D peak picking (M)

Description: Creates additional parameters th2d and xdiag for use with ll2d 2D peak picking program. parll2d is functionally the same as addpar('ll2d').

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
ll2d	Automatic and interactive 2D peak picking (C)
th2d	Threshold for integrating peaks in 2D spectra (P)
xdiag	Threshold for excluding diagonal peaks when peak picking (P)

parlp — Create parameters for linear prediction (M)

Syntax: parlp<(dimension)>

Description: Creates parametrized options for linear prediction (LP) in the current experiment. The display template for the dglp macro is also created if necessary. parlp is functionally the same as addpar('lp').

Arguments: dimension is the dimension of a multidimensional data set. The default is to create the LP parameters lpalg, lpopt, lpfilt, lpnupts, strtlp, lpext, strtext, lptrace, and lpprint.

parlp(1) creates LP parameters lpalg1, lpopt1, lpfilt1, lpnupts1, strtlp1, lpext1, strtext1, lptrace1, and lpprint1. addpar('lp',1) is functionally equivalent to parlp(1).

parlp(2) creates LP parameters lpalg2, lpopt2, lpfilt2, lpnupts2, strtlp2, lpext2, strtext2, lptrace2, and lpprint2. addpar('lp',2) is functionally equivalent to parlp(2).

Examples:

```
parlp
parlp(1)
```

See also: *NMR Spectroscopy User Guide*

Related:

lpalg	LP algorithm for np dimension (P)
lpext	LP data extension for np dimension (P)
lpfilt	LP coefficients to calculate for np dimension (P)
lpnupts	LP number of data points for np dimension (P)
lpopt	LP algorithm data extension for np dimension (P)
lpprint	LP print output for np dimension (P)
lptrace	LP output spectrum for np dimension (P)
proc	Type of processing on np FID (P)
proc1	Type of processing on ni interferogram (P)
proc2	Type of processing on ni2 interferogram (P)
strtext	Starting point for LP data extension for np dimension (P)
strtlp	Starting point for LP calculation for np dimension (P)

parmax — Parameter maximum values (P)

Description: An array that holds the maximum values of other parameters. The maximum value of a parameter is an index into the array, and more than one parameter can have the same index into parmax. Several global parameters set in the Spectrometer Configuration window are part of parmax. To display all parmax values, enter display('parmax','systemglobal').

See also: *User Programming*

Related:

config	Display current configuration and possibly change it (M
display	Display parameters and their attributes (C)
paramedit	Edit a parameter and its attributes with user-selected editor (C)
paramvi	Edit a parameter and its attributes using vi text editor (M)
parmin	Parameter minimum values (P)
parstep	Parameter step size values (P)

parmin — Parameter minimum values (P)

Description: An array that holds the minimum values for other parameters. The minimum value of a parameter is the index into the parmin array. More than one parameter may have the same index into the array. To display all the values in parmin, enter display('parmin','systemglobal').

See also: *User Programming*

Related:

paramvi	Edit a parameter and its attributes using vi text editor (M)
display	Display parameters and their attributes (C)
paramedit	Edit a parameter and its attributes with user-selected editor (C)
parmax	Parameter maximum values (P)
parstep	Parameter step size values (P)

paros — Create additional parameters used by oversampling (M)

Description: Creates the parameters def_osfilt, filtfile, oscoef, osfb, osfilt, oslsfrq, and oversamp for oversampling and digital filtering. paros is functionally the same as addpar('oversamp').

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to current experiment (M
def_osfilt	Default value of osfilt parameter (P)
filtfile	File of FIR digital filter coefficients (P)
oscoef	Digital filter coefficients for oversampling (P)
osfb	Digital filter bandwidth for oversampling (P)
osfilt	Oversampling filter for real-time DSP (P)
oslsfrq	Bandpass filter offset for oversampling (P)
oversamp	Oversampling factor for acquisition (P)

parstep — Parameter step size values (P)

Description: An array that holds the step size values for other parameters. The step size value of a parameter is the index into the array. More than one parameter can have the same index into parstep. Several configuration parameters set in the Spectrometer Configuration window are part of parstep. To display all parstep values, enter display('parstep','systemglobal').

See also: *User Programming*

Related:

config	Display current configuration and possibly change it (M)
display	Display parameters and their attributes (C)
paramedit	Edit a parameter and its attributes with user-selected editor (C)
paramvi	Edit a parameter and its attributes using vi text editor (M)
parmax	Parameter maximum values (P)
parmin	Parameter minimum values (P)

parversion — Version of parameter set (P)

Description: Stores the version of a parameter set. When a parameter set is updated with updatepars or parfix, parversion is set to 4.3 to indicate that fact. When a parameter set is retrieved into an experiment, fixpar checks parversion to determine if other parameters need to be updated using parfix.

See also: *NMR Spectroscopy User Guide*

Related:

fixpar	Correct parameter characteristics in experiment (M)
parfix	Update parameter sets (M)
updatepars	Update all parameter sets saved in a directory (M)

path3d — Path to currently displayed 2D planes from a 3D data set (P)

Description: Stores the absolute path to the current 3D data directory tree. If path3d does not exist, it is created by the macro par3d. The command select, as well as the many macros that make use of select, require path3d in order to know where the 2D planes extracted from a 3D data set can be found.

path3d is set automatically by the macros ft3d and getplane:

- ft3d sets path3d to curexp/datadir3d if ft3d is not supplied with a directory path for the transformed 3D data. If ft3d is supplied with such a directory path (e.g., /home/data/test3D), path3d is set equal to that directory path. In this case, the 3D spectral data would reside in the directory /home/data/test3D/data.
- getplane sets path3d to curexp/datadir3d if getplane is not supplied with a directory path to the transformed 3D data. If getplane is supplied with such a directory path (e.g., /home/data/test3D), path3d is set equal to that directory path. In this case, the extracted 3D planes would reside in the directory /home/data/test3D/extr.

See also: *NMR Spectroscopy User Guide*

Related:

dplane	Display a 3D plane (M)
dproj	Display a 3D plane projection (M)
dsplanes	Display a series of 3D planes (M)
ft3d	Perform a 3D Fourier transform on a 3D FID data set (M)
getplane	Extract planes from a 3D spectral set (M)
nextpl	Display the next 3D plane (M)
par3d	Create 3D acquisition, processing, display parameters (C)
plane	Currently displayed 3D plane type (P)
plplanes	Plot a series of 3D planes (M)
prevpl	Display the previous 3D plane (M)
select	Select a spectrum or 2D plane without displaying it (C)

paxis — Plot horizontal LC axis (M)

Applicability: Systems with the LC-NMR accessory.

Syntax: paxis(time,major_tic,mino_tic)

Description: Plots a horizontal LC axis. Horizontal axes are assumed to be used with “LC plots” of an entire LC run are labeled accordingly. It is assumed that relevant parameters (e.g., sc, wc, vo, vp) have not been changed after plotting the data.

Arguments: time is the time scale, in minutes (decimal values are fine), of the axis.

major_tic is spacing, in minutes (decimal values are fine), of major tics.

minor_tic is spacing, in minutes (decimal values are fine), of minor tics.

See also: *NMR Spectroscopy User Guide*

Pbox — Pulse shaping software (U)

Syntax: `Pbox file options`

Description: Main Pbox (Pandora's Box) program for the generation of shape files for RF and gradients. (See *NMR Spectroscopy User Guide* manual for description of interactive Pbox usage).

Arguments: `file` is the name of a shape file.

`options` is any of the Pbox parameters initialized by the `'-'` sign and followed by the parameter value. The following options can be in any order and combinations:

`-b time`	Activates Bloch simulator, sets `simtime`, in sec.
`-c`	Calibrate only, do not create a shape file.
`-f file`	Set name of the output file.
`-h wave`	Print wave file header.
`-i wave`	Print wave file parameters.
`-l ref_pw90`	Length, in µs, of reference pw90 pulse.
`-o`	List options.
`-p ref_pwr`	Reference power level, in dB.
`-r file`	Reshape Pbox pulse.
`-s stepsize`	Define length, in µs, of a single step in waveform.
`-t wave`	Print wave title.
`-w wavestr`	Set wave data string.
`-v`	Run in verbose mode. Also print Pbox version.
`-value`	Sets reps to value.

Examples:

```
Pbox -i eburp2
Pbox newshape -wc 'eburp1 450 -1280.0' -1
Pbox sel.RF -w 'eburp1 420 -800' 'eburp1 420 1200'
Pbox -w 'eburp1 200 -1200' -attn e -p1 45 54.2 -b
Pbox tst -w 'esnob 20p 170p' -sfrq 150.02 -refofs 55p
-ref_pwr 45 -ref_pw90 54.2
```

See also: *NMR Spectroscopy User Guide*

Related:

`cpx`	Create Pbox shape file (M)
`dprofile`	Display pulse excitation profile from Pbox software (M)
`dshape`	Display pulse shape (M)
`dshapef`	Display last generated pulse shape (M)
`dshapei`	Display pulse shape interactively (M)
`opx`	Open shape definition file for Pbox (M)
`pbox_bw`	Define excitation band (M)
`pbox_bws`	Define excitation band for solvent suppression (notch) pulses (M)
`pbox_dmf`	Extract dmf value from Pbox shape file (M)
`pbox_dres`	Extract dres value from Pbox shape file (M)
`pbox_name`	Extract name of last shape file generated by Pbox (M)
`pbox_pw`	Extract pulse length from Pbox shape file (M)
`pbox_pwr`	Extract pulse power from Pbox shape file (M)
`pbox_pwrf`	Extract pulse fine power from Pbox (M)
`pboxget`	Extract all calibration data from a Pbox shape file (M)

pboxpar	Add parameter definition to the pbox.inp file (M)
pboxrst	Reset temporary Pbox/VnmrJ variables (M)
pboxunits	Converts to Pbox default units (M)
pph	Print pulse header (M)
pprofile	Plot pulse excitation profile from Pbox software (M)
pshape	Plot pulse shape (M)
pshapef	Display pulse shape or modulation pattern interactively (M)
putwave	Write a wave into Pbox.inp file (M)
pxset	Assign Pbox calibration data to experimental parameters (M)
pxshape	Generates a single-band shape file (M)
Pxsim	Simulate Bloch profile for a shaped pulse (M)
Pxspy	Create shape definition using Fourier coefficients (U)
selex	Defines excitation band (M)
setwave	Sets a single excitation band in Pbox.inp file (M)
shdec	Shaped observe excitation sequence (M)

pbox_bw — Define excitation band (M)

Syntax: `pbox_bw<(shapename)>`

Description: Defines the excitation band from the position of cursors in the graphics window and reports them to user. It also sets `r1` to excitation bandwidth and `r2` to offset. This macro is used mainly in Pbox menus and macros.

Arguments: `shapename` is the name of a shape as in `wavelib`; mainly for use with menus.

See also: *NMR Spectroscopy User Guide*

Related: Pbox — Pulse shaping software (U)

pbox_bws — Define excitation band for solvent suppression (notch) pulses (M)

Syntax: `pbox_bws<(shapename)>`

Description: Defines the excitation band from the position of cursors in the graphics window and reports them to user. It also sets `r1` to excitation bandwidth and `r2` to offset. Note, the left cursor should be placed on the left side of the excitation band and the right cursor on resonance of the solvent signal. This macro is mainly used in Pbox menus and macros.

Arguments: `shapename` is the name of a shape file as in `wavelib`, mainly for use with menus.

See also: *NMR Spectroscopy User Guide*

Related: Pbox — Pulse shaping software (U)

pbox_dmf — Extract dmf value from pbox.cal or Pbox shape file (M)

Syntax: `pbox_dmf<(shapefile.DEC)>:exp_param`

Description: Extracts the dmf value from the file `shapefile.DEC` created by Pbox or, if file name is not provided, from the `pbox.cal` file containing parameters of the last created Pbox shape file.

Arguments: `shapefile.DEC` is the name of a shape file.

`exp_param` is a `dmf` type experiment parameter.

Examples:
```
pbox_dmf('myfile.DEC'):mydmf
pbox_dmf:dmf2
```

See also: *NMR Spectroscopy User Guide*

Related:
- dmf — Decoupler modulation frequency for first decoupler (P)
- Pbox — Pulse shaping software (U)

pbox_dres — Extract dres value from pbox.cal or Pbox shape file (M)

Syntax: `pbox_dres<(shapefile.DEC)>:exp_param`

Description: Extracts the dres value from the file `shapefile.DEC` created by Pbox or, if file name is not provided, from the `Pbox.cal` file containing parameters of the last created Pbox shape file.

Arguments: `shapefile.DEC` is the name of a shape file.

`exp_param` is a `dres` type experiment parameter.

Examples:
```
pbox_dres('myfile.DEC'):mydres
pbox_dres:dres2
```

See also: *NMR Spectroscopy User Guide*

Related:
- dres — Tip-angle resolution for first decoupler (P)
- Pbox — Pulse shaping software (U)

pbox_name — Extract name of last shape generated by Pbox from pbox.cal (M)

Syntax: `pbox_name:exp_name`

Description: Extracts name of the last shape file generated by Pbox and stored in the `Pbox.cal` file. Note, that the file name extension is not stored explicitly and is not provided by this macro.

Arguments: `exp_name` returns the name of last shape file.

Examples:
```
pbox_pw:shname
pbox_pw:pwpat
```

See also: *NMR Spectroscopy User Guide*

Related:
- Pbox — Pulse shaping software (U)

pbox_pw — Extract pulse length from pbox.cal or Pbox shape file (M)

Syntax: `pbox_pw<(shapefile.RF)>:exp_param`

Description: Extracts pulse length from the file `shapefile.RF` generated by Pbox or, if file name is not provided, from `pbox.cal` file containing parameters of the last created Pbox shape file. Returns the pulse length, in µs.

Arguments: `shapefile.RF` is the shape file name, including the extension.

`exp_param` is a `pw` type experiment parameter.

Examples:
```
pbox_pw('myfile.RF'):softpw
pbox_pw:selpw
```

See also: *NMR Spectroscopy User Guide*

Related:
- Pbox — Pulse shaping software (U)

pbox_pwr — Extract power level from Pbox.cal or Pbox shape file (M)

Syntax: `pbox_pwr<(shapefile.ext)>:exp_param`

Description: Extracts the power lever from the file `shapefile.ext` generated by Pbox or, if file name is not provided, from the `pbox.cal` file containing parameters of the last created Pbox shape file. Returns the power level, in dB. The

exp_param parameter will not be changed by this macro if the parameter is previously set to 'n' (not used).

Arguments: shapefile.ext is the name of the shape file.

exp_param is a power type experiment parameter.

Examples:
```
pbox_pwr('myfile.DEC'):mypwr
pbox_pwr:dpwr2
```

See also: *NMR Spectroscopy User Guide*

Related: Pbox — Pulse shaping software (U)

pbox_pwrf — Extract fine power level from pbox.cal or Pbox shape file (M)

Syntax: `pbox_pwrf<(shapefile.ext)>:exp_param`

Description: Extracts the fine power lever from the file shapefile.ext generated by Pbox or, if file name is not provided, from the pbox.cal file containing parameters of the last created Pbox shape file. Returns the value of fine power, in dB. Note that the parameter will not be changed by this macro if it was previously set to 'n' (not used).

Arguments: shapefile.ext is the name of the shape file.

exp_param is a fine power type experiment parameter.

Examples:
```
pbox_pwrf('myfile.DEC'):mypwrf
pbox_pwrf:dpwrf
```

See also: *NMR Spectroscopy User Guide*

Related: Pbox — Pulse shaping software (U)

pboxget — Extract Pbox calibration data (M)

Syntax: `pboxget<(shfile.ext)>:$name,$pw,$pwr,$pwrf,$dres,$dmf`

Description: Extracts calibration data from the file shfile.ext generated by Pbox or, if a file name is not provided, from the pbox.cal file containing parameters of the last created Pbox shape file. Returns shape name and the values of total pulse length (in µs), power (dB), fine power, dres, and dmf. The parameter will not be changed by this macro if the parameter was previously set to 'n' (not used).

Arguments: shfile.ext is the name of the shape file, including the extension.

name is the experiment parameter receiving the shape name (without the extension).

pw is the experiment parameter receiving the total pulse length, in µs.

pwr is the experiment parameter receiving the power level, in dB.

pwrf is the experiment parameter receiving the fine power level.

dres is the experiment parameter receiving the decoupler resolution.

dmf is the experiment parameter receiving the decoupler modulation frequency.

Examples:
```
pboxget('myfile.DEC'):dseq,r1,dpwr,dpwrf,dres,dmf
pboxget('selshape.RF'):pwpat,selpw,selpwr
pboxget:dseq2,r1,dpwr2,dpwrf2,dres2,dmf2
```

See also: *NMR Spectroscopy User Guide*

Related: Pbox — Pulse shaping software (U)

P

pboxpar — Add parameter definition to the Pbox.inp file (M)

Syntax: `pboxpar(param,value)`

Description: Adds a parameter definition to the `Pbox.inp` file.

Arguments: `param` is the parameter name

`value` is the value of the parameter.

Examples:
```
pboxpar('name','myfile.DEC')
pboxpar('bsim','y')
pboxpar('T1', 0.24)
```

See also: *NMR Spectroscopy User Guide*

Related: `Pbox` Pulse shaping software (U)

pboxrst — Reset temporary Pbox variables (M)

Description: Resets `r1=0`, `r2=0`, `r3=0`, `r4=0`, `n2='n'`, `n3=''`, and adds some standard comment lines to the `Pbox.inp` file. This macro is used in menus and other Pbox macros.

See also: *NMR Spectroscopy User Guide*

Related: `Pbox` Pulse shaping software (U)

pboxunits — Converts to Pbox default units (M)

Syntax: `pboxunits`

Description: Used by Pbox menus to scale parameters related to time or frequency down to Pbox default units (Hz or seconds) before the parameter is stored in the `Pbox.inp` file.

See also: *NMR Spectroscopy User Guide*

Related: `Pbox` Pulse shaping software (U)

pcon — Plot contours on a plotter (C)

Syntax: `pcon<(<'pos'|'neg'><,'noaxis'><,levels><,spacing>)>`

Description: Plots positive and negative peaks of a contour plot display using different colors. Specifically, if `maxpen` is set for *n* pens, positive peaks are plotted using colors 1 through (*n*+1)/2, and negative peaks are plotted using colors ((*n*+1)/2)+1 through *n* (i.e., half the colors for each, plus one extra for positive if an odd number of pens is specified). Pen 1 is always used for the axes, and the lowest contour of the positive peaks is also plotted with pen1. In all cases, the pen colors are cycled if more contours are to be plotted than there are pens available.

To plot both negative and positive contours of a phase-sensitive spectrum on a monochrome device such as a LaserJet or a plotter with a single pen, different numbers of contours may be plotted for the different sign. For example, `pcon('pos',10,1.4) pcon('neg',1)` will plot ten closely spaced positive contours and one negative contour.

Arguments: `'pos'` is a keyword specifying that phase-sensitive spectra plot positive peaks only. The default is to plot both positive and negative peaks.

`'neg'` is a keyword specifying that phase-sensitive spectra plot negative peaks only. The default is to plot both positive and negative peaks.

`'noaxis'` is a keyword to omit outlining the plot and omit plotting the horizontal and vertical axes.

`levels` is maximum number of contour levels to plot. The default is 4.

`spacing` is relative intensity of successive contour levels. The default is 2.

Examples:
```
pcon
pcon(4,1.4)
pcon('pos','noaxis')
pcon('neg',3)
```

See also: *NMR Spectroscopy User Guide*

Related:

`dpcon`	Display plotted contours (C)
`maxpen`	Maximum number of pens to use (P)

pcss — Calculate and show proton chemical shifts spectrum (M)

Syntax: `pcss<(<threshold><,max_cc><,max_width>)>`

Description: Calculates and shows the proton chemical shifts spectrum. The `dsp` command is used to display the results. The list of chemical shifts is saved in the file `pcss.outpar`. The original spectrum can be calculated by the `wft` command.

Arguments: `threshold` sets the level whether a point belongs to a peak or is noise. The default is that `pcss` automatically calculates the threshold.

`max_cc` is the maximum allowable coupling constant in the spectrum. The default is 20 Hz.

`max_width` is the maximum width of a spin multiplet in the spectrum. The default is 60 Hz.

Examples:
```
pcss
pcss(10)
pcss(9,20,80)
```

See also: *NMR Spectroscopy User Guide*

Related:

`do_pcss`	Calculate proton chemical shifts spectrum (C)
`dsp`	Display pulse sequence (C)
`wft`	Weight and Fourier transform 1D data (C)

peak — Find tallest peak in specified region (C)

Syntax: `peak<(min_freq,max_freq)><:height,freq>`

Description: Returns the height and frequency of the tallest peak in the selected region, including any referencing (i.e., the same frequency that you would measure by placing a cursor on the peak). A spectrum need not actually be displayed for `peak` to work.

Arguments: With no return arguments, `peak` displays on the screen information about peak height and frequency. If two cursors are displayed, `peak` without arguments finds the tallest peak between the cursors.

`min_freq` is minimum frequency limit of the region to be searched. The default value is `sp`.

`max_freq` is maximum frequency limit, in Hz, of the region to be searched. The default value is `sp` + `wp`.

`height` returns the height, in mm, of the tallest peak in the selected region.

`freq` returns the frequency, in Hz, of the tallest peak in the selected region.

Examples:
```
peak:$ht,$freq
peak(0,2000):r3
peak:$ht,cr
```

See also: *User Programming*

Related:

sp	Start of plot (P)
wp	Width of plot (P)

peak2d — Return information about maximum in 2D data (C)

Syntax: `peak2d:$maximum_intensity<,$trace,$point>`

Description: Searches the area defined by sp, wp, sp1, and wp1 in a 2D data set for a maximum intensity.

Arguments: `$maximum_intensity` returns the maximum intensity value found.

`$trace` returns the trace number of the maximum. The parameter `trace` defines whether f_1 or f_2 traces are counted.

`$point` returns the data point number of the maximum on that trace.

See also: *NMR Spectroscopy User Guide*

Related:

sp	Start of plot (P)
sp1	Start of plot in 1st indirectly detected dimension (P)
trace	Mode for *n*-dimensional data display (P)
wp	Width of plot (P)
wp1	Width of plot in 1st indirectly detected dimension (P)

pen — Select a pen or color for drawing (C)

Syntax:
```
pen(<'graphics'|'plotter',><'xor'|'normal',>
   pen|color)
```

Description: Selects the pen number for a plotter or the color for the graphics screen. This command is part of a line drawing capability that includes the move and draw commands. move sets the coordinates from which the line starts. draw draws a line from that point to the new coordinates specified by draw. Refer to the description of draw for examples of using the line drawing capability.

Arguments: `'graphics'` and `'plotter'` are keywords selecting the output device. The default is `'plotter'`. The output selected is passed to subsequent pen, move, or draw commands and remains active until a different output is specified.

`'xor'` and `'normal'` are keywords selecting the drawing mode for the `'graphics'` output device. In the `'xor'` mode, if a line is drawn such that one or more points of the line are in common with a previously drawn line, the common points are erased. In the `'normal'` mode, the common points remain. The mode selected is passed to subsequent pen, draw, *or* move commands and remains active until a different mode is specified. The default mode is `'normal'`.

pen is the plotter pen number: `'pen1'`, `'pen2'`, `'pen3'`, etc.

color is the active color for the graphics screen: `'red'`, `'green'`, `'blue'`, `'cyan'`, `'magenta'`, `'yellow'`, `'black'`, or `'white'`.

Examples:
```
pen('pen2')
pen('graphics','red')
```

See also: *NMR Spectroscopy User Guide*

Related:

draw	Draw line from current location to another location (C)
move	Move to an absolute location (C)

pexpl — Plot exponential or polynomial curves (C)

Syntax: `pexpl<(<options,><line1,line2, ...)>`

Description: Plots exponential curves resulting from T_1, T_2, or kinetics analysis. Also plots polynomial curves from diffusion or other types of analysis. The `analyze.out` file is the data input file used to make the plot. Refer to the `expl` entry for the format of this file. The parameters `sc`, `wc`, `sc2`, and `wc2` control the size of the plot.

Arguments: `options` are any of the following keywords:

- `'linear'`, `'square'`, and `'log'` provide for plotting of the data points against the square or log of the data. `'linear'` controls x-axis scale, `'square'` controls the y-axis. The default is `'linear'`.
- `'link'` causes the data points to be connected rather than a plot of the theoretical curve.
- `'nocurve'` produces a plot of data points only.
- `'oldbox'` plots an additional curve on an existing plot. Only the first data set in `analyze.out` is plotted. It causes the program to get box and scale description from `expfit.out` in the current experiment.
- `'file'` followed by a file name replaces `analyze.out` as the input.

`line1, line2,...` specify curves to be plotted. The default is to plot the first six curves (if that many exist) along with the data points.

Examples:
```
pexpl
pexpl(1,3,6)
```

See also: *NMR Spectroscopy User Guide*, *User Programming*

Related:

`expl`	Display exponential or polynomial curves (C)
`sc`	Start of chart (P)
`sc2`	Start of chart in second direction (P)
`wc`	Width of chart (P)
`wc2`	Width of chart in second direction (P)

pexpladd — Add another diffusion analysis to current plot (M)

Applicability: Systems with the diffusion option.

Syntax: `pexpladd(integral_region)`

Description: Adds results of another diffusion analysis to the currently plotted results.

Arguments: `integral_region` specifies the number of the region whose results are to be added to the existing plot.

Examples:
```
pexpladd(1)
```

See also: *NMR Spectroscopy User Guide*

Related:

`expl`	Display exponential or polynomial curves (C)
`pexpl`	Plot exponential or polynomial curves (C)
`expladd`	Add another diffusion analysis to current display (M)

pfgon — Pulsed field gradient amplifiers on/off control (P)

Applicability: Systems with pulsed field gradient (PFG) modules.

Description: A global string parameter controlling the X, Y, and Z gradients for the PFG current amplifiers. Entering `su` or `go` sets the amplifiers at the current value of `pfgon`. For `pfgon` to take effect, `gradtype` must equal `p`, `q`, `l`, `t`, or `u` for the corresponding X, Y, or Z gradient, and a `su` or a `go` must be issued.

Values: A three-character string, with the first character controlling the X gradient, the second the Y gradient, and the third the Z gradient. For each gradient, setting the value to `y` turns on an amplifier and setting the value to `n` turns it off. For example, `pfgon='nny'` turns on only the PFG amplifier on the Z channel, and `pfgon='nnn'` turns off the PFG amplifiers on all channels.

See also: *NMR Spectroscopy User Guide*

Related:

`go`	Submit experiment to acquisition (M)
`gradtype`	Gradients for X, Y, and Z axes (P)
`setup`	Set up parameters for basic experiments (M)
`su`	Submit a setup experiment to acquisition (M)

pfww — Plot FIDs in whitewash mode (C)

Syntax: `pfww<(<start><,finish><,step><,'all'|'imag'>)>`

Description: Plots FIDs in whitewash mode (after the first FID, each FID is blanked out in regions in which it is behind an earlier FID). The position of the first FID is governed by parameters `wc`, `sc`, and `vpf`.

Arguments: `start` is the index of a particular FID for arrayed 1D or 2D data sets. For multiple FIDs, `start` is the index of the first FID.

`finish` is the index of the last FID for multiple FIDs.

`step` specifies the increment for the FID index. The default is 1.

`'all'` is a keyword to plot all of the FIDs. This is the default.

`'imag'` is a keyword to plot only the imaginary FID channel. The default is `'all'`.

Examples:

```
pfww
pfww(4,10,2,'imag')
```

See also: *NMR Spectroscopy User Guide*

Related:

`dfs`	Display stacked FIDs (C)
`dfww`	Display FIDs in whitewash mode (C)
`plfid`	Plot FIDs (C)
`sc`	Start of chart (P)
`vpf`	Current vertical position of FID (P)
`wc`	Width of chart (P)

pge — Convert parameter set to PGE pulse sequence (M)

Applicability: Systems with the diffusion option.

Description: Adds all necessary parameters to perform the PGE (Pulse Gradient Experiment) pulse sequence, taking those parameters from the file `/vnmr/parlib/pge`.

See also: *NMR Spectroscopy User Guide*

Related:

`pge_calib`	Calibrate gradient strengths for PGE pulse sequence (M)
`pge_data`	Extract data from single element of PGE pulse sequence (M)
`pge_output`	Output results from PGE pulse sequence (M)
`pge_process`	Automated processing of data from PGE pulse sequence (M)
`pge_results`	Calculate diffusion constant for integral region (M)
`pge_setup`	Set up gradient control parameters for PGE pulse sequence (M)

pge_calib — Calibrate gradient strengths for PGE pulse sequence (M)

Applicability: Systems with the diffusion option.

Description: Calibrates the parameters `grad_cw_coef` and `grad_p_coef`, which relate the DAC values (in DAC units) to the gradient strengths (in gauss/cm). Given a diffusion constant measurement (made with `pge_results`) for a known diffusion constant, `pge_calib` then adjusts the calibration parameters to produce the correct diffusion constant.

See also: *NMR Spectroscopy User Guide*

Related:

`pge`	Calibrate gradient strengths for PGE pulse sequence (M)
`pge_results`	Calculate diffusion constant for integral region (M)

`pge_data` Extract data from single element of PGE pulse sequence (M)

Applicability: Systems with the diffusion option.

Syntax: `pge_data(array_index)`

Description: Extracts integral information from a currently displayed element of a PGE (Pulse Gradient Experiment) and writes the results in the current experiment directory as the file `info_#`, where # is the value of the `array_index` argument (e.g., if `array_index` is 5, the file is `info_5`)

Arguments: `array_index` is the number of the array element from which the data is extracted.

Examples: `pge_data(5)`

See also: *NMR Spectroscopy User Guide*

Related:

`pge`	Calibrate gradient strengths for PGE pulse sequence (M)

`pge_output` Output results from PGE pulse sequence (M)

Applicability: Systems with the diffusion option.

Description: Prints the calculated results from the PGE (Pulse Gradient Experiment) pulse sequence on a printer and plots the graphs of calculated decay curves.

See also: *NMR Spectroscopy User Guide*

Related:

`pge`	Calibrate gradient strengths for PGE pulse sequence (M)

`pge_process` Automated processing of data from PGE pulse sequence (M)

Applicability: Systems with the diffusion option.

Syntax: `pge_process`

Description: Performs full automated processing of data from a PGE (Pulse Gradient Experiment) pulse sequence.

See also: *NMR Spectroscopy User Guide*

Related:

`pge`	Calibrate gradient strengths for PGE pulse sequence (M)

`pge_results` Calculate diffusion constant for integral region (M)

Applicability: Systems with the diffusion option.

Syntax: `pge_results(integral_region<,reference_region>)`

Description: Calculates a diffusion coefficient based on a single integral region in the spectrum (if one input argument) or calculates diffusion coefficient of an integral region consisting of two components (if two input arguments).

Arguments: `integral_region` is the number of the integral region on which to perform the analysis

reference_region is the number of the integral region used to get the value of the diffusion coefficient.

Examples:
```
pge_results(2)
pge_results(1,3)
```

See also: *NMR Spectroscopy User Guide*

Related: pge — Calibrate gradient strengths for PGE pulse sequence (M)

pge_setup — Set up gradient control parameters for PGE pulse sequence (M)

Applicability: Systems with the diffusion option.

Syntax: `pge_setup<('no')>`

Description: Prompts the user for the values of the g_max, g_min, g_steps, g_array, nt_first, nt_aray, and other parameters for the PGE (Pulse Gradient Experiment) pulse sequence. These parameters are then used to calculate the grad_p1 and nt arrays.

Arguments: 'no' is a keyword to turn off prompting the user and instead use the current values of the parameters to calculate the grad_p1 and nt arrays.

Examples:
```
pge_setup
pge_setup('no')
```

See also: *NMR Spectroscopy User Guide*

Related: pge — Calibrate gradient strengths for PGE pulse sequence (M)

ph — Set phased mode in directly detected dimension (C)

Description: Selects the phased mode by setting the parameter dmg='ph'. In the *phased spectra display mode*, each real point in the displayed spectrum is calculated from a linear combination of the real and imaginary points comprising each respective complex data point. The coefficients for this linear combination are derived from the phase parameters rp and lp.

For 2D data, if pmode='partial' or pmode='' (two single quotes with no space in between), ph has an effect on the data prior to the second Fourier transform. If pmode='full', ph acts in concert with the commands ph1, av1, or pwr1 to yield the resultant contour display for the 2D data.

See also: *NMR Spectroscopy User Guide*

Related:

av	Set abs. value mode in directly detected dimension (C)
av1	Set abs. value mode in 1st indirectly detected dimension (C)
dmg	Data display mode in directly detected dimension (P)
ft	Fourier transform 1D data (C)
ft1d	Fourier transform along f_2 dimension (C)
ft2d	Fourier transform 2D data (C)
lp	First-order phase in directly detected dimension (P)
pa	Set phase angle mode in directly detected dimension (C)
pa1	Set phase angle mode in 1st indirectly detected dimension (C)
ph1	Set phased mode in 1st indirectly detected dimension (C)
ph2	Set phased mode in 2nd indirectly detected dimension (C)
pmode	Processing mode for 2D data (P)
pwr	Set power mode in directly detected dimension (C)
pwr1	Set power mode in 1st indirectly detected dimension (C)
rp	Zero-order phase in directly detected dimension (P)
wft	Weight and Fourier transform 1D data (C)
wft1d	Weight and Fourier transform f_2 of 2D data (M)
wft2d	Weight and Fourier transform 2D data (M)

ph1 — Set phased mode in 1st indirectly detected dimension (C)

Description: Selects the phased spectra display mode along the first indirectly detected dimension by setting the parameter dmg1 to the string value 'ph1'. If the parameter dmg1 does not exist, ph1 will create it and set it to 'ph1'.

In the phased mode, each real point in the displayed trace is calculated from a linear combination of the real and imaginary points comprising each respective complex data point. For hypercomplex data, the linear combination uses the real-real and imaginary-real points from each respective hypercomplex data point. The coefficients for this linear combination are derived from the phase parameters rp1 and lp1.

The ph1 command is only needed if mixed-mode display is desired. If the parameter dmg1 does not exist or is set to the null string, the display mode along the first indirectly detected dimension defaults to the display mode of the directly detected dimension (characterized by the parameter dmg). For the contour display of multidimensional data, the result of ph1 is the same as for traces provided that pmode='partial' or pmode=''.

See also: *NMR Spectroscopy User Guide*

Related:

av1	Set abs. value mode in 1st indirectly detected dimension (C)
dmg1	Data display mode in 1st indirectly detected dimension (P)
lp1	First-order phase in 1st indirectly detected dimension (P)
pa	Set phase angle mode in directly detected dimension (C)
pa1	Set phase angle mode in 1st indirectly detected dimension (C)
ph	Set phased mode in directly detected dimension (C)
pmode	Processing mode for 2D data (P)
pwr1	Set power mode in 1st indirectly detected dimension (C)
rp1	Zero-order phase in 1st indirectly detected dimension (P)

ph2 — Set phased mode in 2nd indirectly detected dimension (C)

Description: Selects phased spectrum display mode processing along the second indirectly detected dimension by setting the parameter dmg2='ph2'. If dmg2 does not exist or is set to the null string, ph2 creates dmg2 and sets it to 'ph2'.

In the phased mode, each real point in the displayed trace is calculated from a linear combination of the real and imaginary points comprising each respective complex data point. For hypercomplex data, the linear combination uses the real-real and imaginary-real points from each respective hypercomplex data point. The coefficients for this linear combination are derived from the phase parameters rp2 and lp2.

The ph2 command is only needed if mixed-mode display is desired. If the parameter dmg2 does not exist or is set to the null string, the display mode along the second indirectly detected dimension defaults to the display mode of the directly detected dimension (characterized by the parameter dmg). For the contour display of multidimensional data, the result of ph2 is the same as for traces provided that pmode='partial' or pmode=''.

See also: *NMR Spectroscopy User Guide*

Related:

av2	Set abs. value mode in 2nd indirectly detected dimension (C)
dmg2	Data display mode in 2nd indirectly detected dimension (P)
ft1d	Fourier transform along f_2 dimension (C)
ft2d	Fourier transform 2D data (C)
lp2	First-order phase in 2nd indirectly detected dimension (P)
ph	Set phased mode in directly detected dimension (C)
pmode	Processing mode for 2D data (P)
pwr2	Set power mode in 2nd indirectly detected dimension (C)
rp2	Zero-order phase in 2nd indirectly detected dimension (P)

P

phase — Change frequency-independent phase rp (M)

Syntax: `phase(phase_change)`

Description: Changes the phase of all peaks in the spectrum by adding a value to the current `rp` value. Any excess over 360° is removed.

Arguments: `phase_change` is the value to be added to the current `rp` value (i.e., *new* `rp` = *old* `rp` + `phase_change`).

Examples: phase(45)

See also: *NMR Spectroscopy User Guide*

Related:

`rp`	Zero-order phase in directly detected dimension (P)

phase — Phase selection (P)

Description: Selects the phase cycling that determines the experiment type. To create the parameters `phase`, `ni`, and `sw1` for acquisition of a 2D data set in the current experiment, enter `addpar('2d')`.

Values: The following values are generally used in experiments with phase cycling. For more details, see the specific pulse sequence.

`phase=0` selects an absolute-value 2D experiment.

`phase=1,2` selects the required two components of a hypercomplex (States-Haberkorn) experiment.

`phase=3` selects TPPI (Time Proportional Phase Incrementation).

See also: *NMR Spectroscopy User Guide*

Related:

`addpar`	Add selected parameters to the current experiment (M)
`cosyps`	Set up parameters for phase-sensitive COSY (M)
`Dqcosy`	Set up parameters for double quantum filtered COSY (M)
`Hmqc`	Set up parameters for HMQC pulse sequence (M)
`hmqcr`	Set up parameters for HMQCR pulse sequence (M)
`inadqt`	Set up parameters for INADEQUATE pulse sequence (M)
`mqcosy`	Set up parameters for MQCOSY pulse sequence (M)
`Noesy`	Set up parameters for NOESY pulse sequence (M)
`Roesy`	Set up parameters for ROESY pulse sequence (M)
`Tocsy`	Set up parameters for TOCSY pulse sequence (M)

phase1 — Phase of first pulse (P)

Applicability: Systems with a solids NMR module.

Description: Controls the first pulse phase in the cycle, in multipulse experiments.

See also: *NMR Spectroscopy User Guide*

Related:

`br24`	Set up BR24 multiple pulse experiment (M)
`flipflop`	Set up sequences for multipulse (M)

phase2 — Phase selection for 3D acquisition (P)

Description: Selects phase cycling type for 3D data acquisitions. Also selects the phase of the second pulse in the sequence set up by `flipflop`. To create the parameters `phase2`, `d3`, `ni2`, and `sw2` for acquisition of a 3D data set in the current experiment, enter `addpar('3d')`.

See also: *NMR Spectroscopy User Guide; User Guide: Solid-State NMR*

Related:

`addpar`	Add selected parameters to the current experiment (M)
`d3`	Incremented delay for 2nd indirectly detected dimension (P)

flipflop	Set up sequences for multipulse (M)
ni2	Number of increments in 2nd indirectly detected dimension (P)
par3d	Create 3D acquisition, processing, display parameters (C)
sw2	Spectral width in 2nd indirectly detected dimension (P)

phase3 — Phase selection for 4D acquisition (P)

Description: Selects phase cycling type for 4D data acquisitions. To create the parameters phase3, d4, ni3, and sw3 for acquisition of a 4D data set in the current experiment, enter addpar('4d').

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
d4	Incremented delay for 3rd indirectly detected dimension (P)
ni3	Number of increments in 3rd indirectly detected dimension (P)
par4d	Create 4D acquisition parameters (C)
sw3	Spectral width in 3rd indirectly detected dimension (P)

phasing — Control update region during interactive phasing (P)

Description: Controls the percentage of the spectrum updated during interactive phasing using the ds command.

Values: 10 to 100, in percent, where 100 causes the entire spectrum to be updated, and 20 causes the area between the two vertical cursors to be updated.

See also: *NMR Spectroscopy User Guide*

Related:

ds	Display a spectrum (C)

phfid — Zero-order phasing constant for the np FID (P)

Description: Specifies the angle of zero-order rotation. This zero-order rotation is executed as a part of retrieving the time-domain data into the active region of the memory and can be used instead of the parameter rp applied to the frequency-domain data. phfid is used only in a complex phase rotation.

phfid (and related parameters lsfid and lsfrq) operate on complex np FID data, referred to as the t_2 dimension in a 2D experiment or as the t_3 dimension in a 3D experiment. phfid is in the processing group and is properly handled through the wti display.

Values: –360.0 to +360.0, in degrees; 'n'

See also: *NMR Spectroscopy User Guide*

Related:

dfid	Display a single FID (C)
ds	Display a spectrum FID (C)
ft	Fourier transform 1D data (C)
ft1d	Fourier transform along f_2 dimension (C)
ft2d	Fourier transform 2D data (C)
lsfid	Number of complex points to left-shift the np FID (P)
lsfrq	Frequency shift of the fn spectrum in Hz (P)
np	Number of data points (P)
phfid1	Zero-order phasing constant for ni interferogram (P)
phfid2	Zero-order phasing constant for ni2 interferogram (P)
rp	Zero-order phase in directly detected dimension (P)
wft	Weight and Fourier transform 1D data (C)
wft1d	Weight and Fourier transform f_2 of 2D data (M)
wft2d	Weight and Fourier transform 2D data (M)
wti	Interactive weighting (C)

P

phfid1 — Zero-order phasing constant for ni interferogram (P)

Description: Specifies the angle of zero-order rotation. This zero-order rotation is executed as a part of retrieving the time-domain data into the active region of the memory and can be used instead of the parameter rp1 applied to the frequency-domain data. phfid1 is used in a complex phase rotation for complex t_1/t_2 interferograms and in a hypercomplex phase rotation for hypercomplex t_1/t_2 interferograms.

phfid1 (and related parameters lsfid1 and lsfrq1) operate on ni interferogram data, both hypercomplex and complex. ni interferogram data are referred to as the t_1 dimension in both a 2D and a 3D experiment. phfid1 is in the processing group and is properly handled through the wti display; that is, a wti operation on an ni interferogram applies the parameters phfid1, lsfid1, and lsfrq1, if selected, to the time-domain data prior to the Fourier transformation.

Values: –360.0 to +360.0, in degrees; 'n'.

See also: *NMR Spectroscopy User Guide*

Related:

lsfid1	Number of complex points to left-shift the ni interferogram (P)
lsfrq1	Frequency shift of the fn1 spectrum in Hz (P)
ni	Number of increments in 1st indirectly detected dimension (P)
phfid	Zero-order phasing constant for np FID (P)
phfid2	Zero-order phasing constant for ni2 interferogram (P)
rp1	Zero-order phase in 1st indirectly detected dimension (P)
wti	Interactive weighting (C)

phfid2 — Zero-order phasing constant for ni2 interferogram (P)

Description: Specifies the angle of zero-order rotation. This zero-order rotation is executed as a part of retrieving the time-domain data into the active region of the memory and can be used instead of the parameter rp2 applied to the frequency-domain data. phfid2 is used in a complex phase rotation for complex t_1/t_2 interferograms and in a hypercomplex phase rotation for hypercomplex t_1/t_2 interferograms.

phfid2 (and related parameters lsfid2 and lsfrq2) operate on ni2 interferogram data, both hypercomplex and complex. ni2 interferogram data are referred to as the t_2 dimension in a 3D experiment. phfid2 is in the processing group and is properly handled through the wti display.

Values: –360.0 to +360.0, in degrees; 'n'.

See also: *NMR Spectroscopy User Guide*

Related:

lsfid2	Number of complex points to left-shift ni2 interferogram (P)
lsfrq2	Frequency shift of the fn2 spectrum in Hz (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
phfid	Zero-order phasing constant for np FID (P)
phfid1	Zero-order phasing constant for ni interferogram (P)
rp2	Zero-order phase in 2nd indirectly detected dimension (P)
wti	Interactive weighting (C)

Phosphorus — Set up parameters for ^{31}P experiment (M)

Description: Set up parameters for ^{31}P experiment.

pi3ssbsq — Set up pi/3 shifted sinebell-squared window function (M)

Syntax: pi3ssbsq<(<t1_inc><,t2_inc>)>

Description: Sets up a pi/3 unshifted sinebell-squared window function in 1, 2, or 3 dimensions. The macro checks whether the data is 1D, 2D, and 3D.

Arguments: `t1_inc` is the number of t1 increments. The default is `ni`.

`t2_inc` is the number of t2 increments. The default is `ni2`.

See also: *NMR Spectroscopy User Guide*

Related:

`gaussian`	Set up unshifted Gaussian window function (M)
`ni`	Number of increments in 1st indirectly detected dimension (P)
`ni2`	Number of increments in 2nd indirectly detected dimension (P)
`pi4ssbsq`	Set up pi/4 shifted sinebell-squared window function (M)
`sqcosine`	Set up unshifted cosine-squared window function (M)
`sqsinebell`	Set up unshifted sinebell-squared window function (M)

`pi4ssbsq` Set up pi/4 shifted sinebell-squared window function (M)

Syntax: `pi4ssbsq<(<t1_inc><,t2_inc>)>`

Description: Sets up a pi/4 unshifted sinebell-squared window function in 1, 2, or 3 dimensions. The macro checks whether the data is 1D, 2D, and 3D.

Arguments: `t1_inc` is the number of t1 increments. The default is `ni`.

`t2_inc` is the number of t2 increments. The default is `ni2`.

See also: *NMR Spectroscopy User Guide*

Related:

`gaussian`	Set up unshifted Gaussian window function (M)
`ni`	Number of increments in 1st indirectly detected dimension (P)
`ni2`	Number of increments in 2nd indirectly detected dimension (P)
`pi3ssbsq`	Set up pi/3 shifted sinebell-squared window function (M)
`sqcosine`	Set up unshifted cosine-squared window function (M)
`sqsinebell`	Set up unshifted sinebell-squared window function (M)

`pin` Pneumatics Router Interlock ((P)

Description: This parameter controls the effect of a Pneumatics Router Fault. The Pneumatic Router can fault in four ways:

- Intake pressure < 20 psi
- Solids narrow bore stack temperature fault
- VT air flow exceeded.
- Power supply fault

When either of these fault occur, and interrupt alerts the console of the problem and this parameter determines how the fault is handled. Once a fault is registered, all subsequent acquisitions will see the error according to 'pin'. The error must be cleared and re-armed with sethw('pneufault','clear')

Values: `'n'` -- the fault is ignored
`'w'` -- a warning msg is printed, acquisition continues
`'y'` -- an error msg is printed, acquisition is aborted

Related:

`tin`	Temperature interlock (P)
`vtairflow`	VT air flow (P)
`vtairlimits`	VT air flow limits (P)

`pintvast` Plots of integral regions (M)

Applicability: Systems with VAST accessory.

Syntax: `pintvast (last)`

Description: `pintvast` plots the integrals of the partial regions of each spectra from wells 0 to `last`.

Arguments: `last` is the number last sample well. The default is 96.

See also: *NMR Spectroscopy User Guide*

Related:

`intvast`	Builds text file the integral regions (M)

pir — Plot integral amplitudes below spectrum (C)

Description: Plots integral amplitudes below the appropriate spectral regions.

See also: *NMR Spectroscopy User Guide*

Related:

`dpf`	Display peak frequencies over spectrum (C)
`dpir`	Display integral amplitudes below spectrum (C)
`dpirn`	Display normalized integral amplitudes below spectrum (M)
`pirn`	Plot normalized integral amplitudes below spectrum (M)
`ppf`	Plot peak frequencies over spectrum (M)

pirn — Plot normalized integral amplitudes below spectrum (M)

Description: Equivalent to the command `pir` except that the sum of the integrals is normalized to the value of the parameter `ins`.

See also: *NMR Spectroscopy User Guide*

Related:

`dpirn`	Display normalized integral amplitudes below spectrum (M)
`ins`	Integral normalization scale (P)
`pir`	Plot integral amplitudes below spectrum (C)

piv — Plot integral values below spectrum (M)

Syntax: `piv<(vertical_position)>`

Description: Labels integrals with a bracket below the spectrum and a vertical number indicating the integral value. See `dpiv` for description and use.

Related:

`dpir`	Display integral amplitudes below spectrum (C)
`dpiv`	Display integral amplitudes below spectrum (M)
`dpirn`	Display normalized integral amplitudes below spectrum (C)
`dpivn`	Display normalized integral amplitudes below spectrum (M)
`pirn`	Plot normalized integral amplitudes below spectrum (C)
`pir`	Plot integral amplitudes below spectrum (C)
`pivn`	Plot normalized integral amplitudes below spectrum (M)

pivn — Plot normalized integral values below spectrum (M)

Syntax: `pivn<(vertical_position)>`

Description: Labels integrals with a bracket below the spectrum and a vertical number indicating the integral value. See `dpiv` for description and use.

Related:

`dpir`	Display integral amplitudes below spectrum (C)
`dpiv`	Display integral amplitudes below spectrum (M)
`dpirn`	Display normalized integral amplitudes below spectrum (C)
`dpivn`	Display normalized integral amplitudes below spectrum (M)

pirn	Plot normalized integral amplitudes below spectrum (C)
pir	Plot integral amplitudes below spectrum (C)
piv	Plot integral amplitudes below spectrum (M)

pl — Plot spectra (C)

Syntax:
```
pl<(<start,finish<,step>><,'int'><,'all'>
   <,options>)>
```

Description: Plots one or more spectra. When a single spectrum is plotted, integral plotting is controlled by the parameter intmod as follows: intmod='off' turns off the integral plot, intmod='full' plots the entire integral, and intmod='partial' plots every other integral region.

For arrayed 1D spectra or for 2D spectra, a particular trace can be plotted by supplying the index number as an argument. For 2D data sets, spectra can be plotted from either the f_1 or f_2 domain by setting the parameter trace to 'f1' or 'f2', respectively. After the command ft1d, interferogram can be plotted by setting trace='f1' and then typing pl. Multiple spectra can be plotted by supplying the indexes of the first and last spectra.

The position of the first spectrum is governed by the parameters wc, sc, and vp. For 1D data, subsequent spectra are positioned relative to the preceding spectrum by the vertical and horizontal offset parameters vo and ho. For 2D data, ho defines the total horizontal offset between the first and last spectrum. Also for 2D data, vo is inactive while the parameter wc2 defines the total vertical offset between the first and last spectrum.

The parameter cutoff, if it exists and is active, defines the distance above and below the current vertical position vp at which peaks are truncated. By arraying cutoff to have two different values, truncation limits above and below the current vertical position can be controlled. For example, cutoff=50 truncates peaks at vp+50 mm and vp–50 mm. cutoff=50,10 truncates peaks at vp+50 mm and vp–10 mm.

Arguments: start is the index of a particular trace for arrayed 1D or 2D spectra. For multiple spectra, start is the index of the first spectrum.

finish is the index of the last spectrum for multiple spectra.

step specifies the increment for the spectral index. The default is 1.

'int' is a keyword that specifies displaying only the integral, independently of the value of intmod.

'all' is a keyword to plot all of the spectra. This value is the default.

options can be any of the following keywords:

- 'top' or 'side' cause the spectrum to be plotted either above or at the left edge of a contour plot. This assumes that the parameters sc, wc, sc2, and wc2 are those used to position the contour plot.
- 'dodc' causes all spectra to be drift corrected independently.
- 'pen1', 'pen2', 'pen3', etc. specify a pen number on a plotter.

Examples:
```
pl
pl(1,6,2)
```

See also: *NMR Spectroscopy User Guide*

Related:

cutoff	Data truncation limit (P)
dssa	Display stacked spectra automatically (C)
dsww	Display spectra in whitewash mode (C)
ft1d	Fourier transform along f_2 dimension (C)
ho	Horizontal offset (P)
intmod	Integral display mode (P)

plww	Plot spectra in whitewash mode (C)
pshr	PostScript High Resolution plotting control (P)
pslw	PostScript Line Width control (P)
sc	Start of chart (P)
sc2	Start of chart in second direction (P)
shownumx	x position counting from bottom left of every spectrum (P)
shownumy	y position counting from bottom left of every spectrum (P)
trace	Mode for 2D data display (P)
vo	Vertical offset (P)
vp	Vertical position of spectrum (P)
wc	Width of chart (P)
wc2	Width of chart in second direction (P)

pl2d — Plot 2D spectra in whitewash mode (C)

Syntax: `pl2d<('nobase'|'fill'|'fillnb')>`

Description: Plots a stacked plot of 2D spectra in whitewash mode (after the first spectra, each spectra is blanked out in regions in which it is behind an earlier spectra). Color does not represent intensity (unlike dcon), since intensity can be seen visually, but instead successive traces are displayed in different colors so that color represents frequency. The horizontal offset parameter ho is not active for this command.

Arguments: 'nobase' is a keyword to activate th to suppress intensity below th.

'fill' is a keyword to fill in the peaks. Note that if 'fill' (or 'fillnb') is used, th operates linearly and not logarithmically (with factors of 2) as it does in contour or color intensity displays.

'fillnb' is a keyword to combine base suppression and peak filling.

Examples:
```
pl2d
pl2d('nobase')
```

See also: *NMR Spectroscopy User Guide*

Related:

dcon	Display noninteractive color intensity map (C)
ds2d	Display 2D spectra in whitewash mode (C)
dsww	Display spectra in whitewash mode (C)
ho	Horizontal offset (P)
plww	Plot spectra in whitewash mode (C)
th	Threshold (P)

plane — Currently displayed 3D plane type (P)

Description: Stores the type of 3D plane currently displayed within VnmrJ. If plane does not exist, it is created by the macro par3d. The command select, as well as the many macros that make use of select, requires the parameter plane to exist for 3D data sets and to contain an appropriate value.

plane is set automatically by the macro getplane; it can also be set by the macro ft3d if automatic plane extraction is requested at the end of the 3D FT. The order of priority for the plane types is 'f1f3', 'f2f3', and then 'f1f2'. In other words, if getplane is requested to extract the f_1f_3 and the f_2f_3 planes, plane will be set to 'f1f3'. plane can also be set manually.

Values: 'f1f3', 'f3f1', 'f2f3', 'f3f2', 'f1f2', or 'f2f1'

See also: *NMR Spectroscopy User Guide*

Related:

dplane	Display a 3D plane (M)
dproj	Display a 3D plane projection (M)

dsplanes	Display a series of 3D planes (M)
ft3d	Perform a 3D Fourier transform on a 3D FID data set (M,U)
getplane	Extract planes from a 3D spectral set (M)
nextpl	Display the next 3D plane (M)
par3d	Create 3D acquisition, processing, display parameters (C)
path3d	Number of complex points to left-shift np FID (P)
plplanes	Plot a series of 3D planes (M)
prevpl	Display the previous 3D plane (M)
select	Select a spectrum or 2D plane without displaying it (C)

plapt — Plot APT-type spectra automatically (M)

Syntax: `plapt<(13Cexp_number)>`

Description: Automatically plots APT spectra. The APT spectrum is plotted on top of a standard carbon spectrum if either an experiment with such data is specified or if a file `C13` is found in `curexp+'/subexp'`. If neither such a subfile is found nor an experiment with standard carbon data is specified, the APT spectrum is plotted alone.

Arguments: `13Cexp_number` specifies the number, from 1 to 9, of an experiment with a standard ^{13}C spectrum.

Examples:
```
plapt
plapt(2)
```

See also: *NMR Spectroscopy User Guide*

Related:

curexp	Current experiment directory (P)

plarray — Plotting macro for arrayed 1D spectra (M)

Description: A generic macro for plotting arrayed 1D spectra. `plarray` is called by the `plot` macro, but can also be used directly. For the plot layout, `procarray` distinguishes between arrays with few elements (6 or less), which will be stacked vertically (no horizontal offset), and spectra with many (greater than 6) elements. Those are stacked horizontally by default, unless there are too many lines, in which case a diagonally stacked display is chosen. Horizontal stacking is mostly adequate for pulse and power calibrations, where there are usually few lines only; diagonally stacked displays/plots are frequently chosen for T_1 and T_2 experiments on entire spectra, often with many lines.

The automatic stacking mode can be overridden by creating and setting a string parameter `stackmode` in the startup macro or before calling `procplot` or `procarray`. Possible values for `stackmode` are `'horizontal'`, `'vertical'`, or `'diagonal'`. DEPT-type spectra can, in principle, also be processed with `procarray`, but no DEPT editing occurs, of course.

See also: *NMR Spectroscopy User Guide*

Related:

aexppl	Automatic expansion plot (M)
plc	Plot carbon spectrum (M)
plh	Plot proton spectrum (M)
plot	Automatically plot spectra (M)
procarray	Process arrayed 1D spectra (M)
stackmode	Stack control for processing arrayed 1D spectra (P)

plate_glue — Define a glue order for plotting and display (U)

Applicability: Systems with VAST accessory

Description: In a Unix terminal or shell window type plate_glue. The glue order is determined by clicking on the wells to be displayed. Save the glue order file in the user's vnmrsys/templates/glue directory.

See also: *NMR Spectroscopy User Guide*

Related:

`dsvast2d`	Display VAST data in a pseudo-2D format (M)
`plvast`	Plot VAST data in a stacked 1D-NMR matrix (M)
`plvast2d`	Plot VAST data in a pseudo-2D format (M)

`plc` Plot a carbon spectrum (M)

Syntax: `plc<(pltmod)>`

Description: Plots a carbon spectrum based on the parameters `pltmod` (the options `'off'`, `'full'`, and `'fixed'` are implemented) and `intmod` (`'off'`, `'full'`, and `'partial'` are implemented). Peak frequency labels, in ppm, are usually plotted.

Arguments: `pltmod` is an alternate value of `pltmod` for this macro only. The value of the `pltmod` parameter is not changed.

Examples:

```
plc
plc('full')
```

See also: *NMR Spectroscopy User Guide*

Related:

`intmod`	Integral display mode (P)
`pltmod`	Plotter display mode (P)

`plcosy` Plot COSY- and NOESY-type spectra automatically (M)

Syntax: `plcosy(<'pos'|'neg'><,><levels<,spacing<,exp1D>>>)`

Description: Automatically plots 2D COSY- and NOESY-type spectra (homonuclear correlated spectra). Features include the following:

- Keeps the orientation (f_1, f_2) of the spectrum on the screen.
- Plot area is optimized.
- Number of contour levels and their spacing can be selected.
- Negative or positive contours can be suppressed.
- 1D traces can be plotted along both axes; such 1D traces are taken from a full (or reduced) 1D spectrum in an other experiment, or from a subfile from within the current experiment.
- Works correctly for expansions.
- 1D traces can be suppressed, allowing a larger area for the 2D spectrum.
- 1D spectrum can be in any experiment.
- With phase-sensitive spectra using a plotter with one pen or a printer such as a LaserJet, if `'pos'` or `'neg'` are not selected, seven positive levels (or the specified number of positive contours) and one negative level are plotted, to distinguish positive and negative signals.

In multiexperiment mode, for the first plot, the experiment with the 1D spectrum should be specified (at least if it is not in exp1). From then on, the 1D spectrum will be stored *within* the experiment with the 2D spectrum, which allows much faster switching between spectra and also frees the other (1D) experiment for other tasks. Because of this internal storage, the `exp1D` argument is not required for subsequent plots.

Arguments: `'pos'` is a keyword to plot only positive contours.

'neg' is a keyword to plot only negative contours.

levels is the number of contour levels. The default is 7.

spacing is the spacing between the contours. The default is 2.

exp1D is the experiment in which the proton 1D spectrum resides. This can be a full 1D spectrum, but the referencing must be the same as for the 2D. A negative number suppresses the proton trace. The default is from a subfile.

Examples:
```
plcosy
plcosy(12,1.5)
plcosy('pos',7,2,3)
plcosy(7,2,-1)
plcosy('neg')
```

See also: *NMR Spectroscopy User Guide*

pldept — Plot DEPT data, edited or unedited (M)

Description: Plots out DEPT data, either edited or not edited.

See also: *NMR Spectroscopy User Guide*

Related:

adept	Automatic DEPT analysis and spectrum editing (C)
autodept	Automated complete analysis of DEPT data (M)
deptproc	Process DEPT data (M)
padept	Perform adept analysis and plot resulting spectra (C)

plfid — Plot FIDs (C)

Syntax:
```
plfid<(<start><,finish><,step><,'all'|'imag'>
   <,pen>)>
```

Description: Plots one or more FIDs. The position of the first FID is governed by the parameters wc, sc, and vpf. A subsequent FID is positioned relative to the preceding FID by the vertical and horizontal offset parameters vo and ho.

Arguments: start is the index of a particular FID for arrayed 1D or 2D data sets. For multiple FIDs, start is the index of the first FID.

finish is the index of the last FID for multiple FIDs. To include all FIDs, set start to 1 and finish to the parameter arraydim (see example).

step specifies the increment for the FID index. The default is 1.

'all' is a keyword to plot all of the FIDs. This is the default.

'imag' is a keyword to plot the imaginary FID channel only. The default is 'all'.

pen is a keyword with the plotter pen number: 'pen1', 'pen2', 'pen3', etc. The default is 'pen1'.

Examples:
```
plfid(1,arraydim,3)
```

See also: *NMR Spectroscopy User Guide*

Related:

arraydim	Dimension of experiment (P)
dfs	Display stacked FIDs (C)
dfww	Display FIDs in whitewash mode (C)
ho	Horizontal offset (P)
sc	Start of chart (P)
vo	Vertical offset (P)
vpf	Current vertical position of FID (P)
wc	Width of chart (P)

P

plfit — Plot deconvolution analysis (M)

Description: Produces a complete output plot of a deconvolution analysis, plotting the observed spectrum, the full calculated spectrum, each individual component, as well as the numerical results of the analysis.

See also: *NMR Spectroscopy User Guide*

Related:

fitspec	Perform spectrum deconvolution (C)
showfit	Display numerical results of deconvolution (M)
usemark	Use “mark” output as deconvolution starting point (M)

plgrid — Plot a grid on a 2D plot (M)

Syntax:
(1) `plgrid<(<spacing><,><pen>)>`
(2) `plgrid<(start_f2,incr_f2,start_f1,incr_f1<,pen>)>`

Description: Plots grid lines over a 2D plot.

Arguments: `spacing` specifies the approximate spacing of the grid lines, in cm. The default is intervals of approximately 1 cm, rounded so that the intervals fall at a multiple of 1, 2, or 5 (in Hz) or 1p, 2p, or 5p (in ppm).

`pen` is a keyword with the plotter pen number: `'pen1'`, `'pen2'`, `'pen3'`, etc. The default is `'pen1'`.

`start_f2, incr_f2, start_f1, incr_f1` define the starting and increment frequencies in both f_2 and f_1 for a grid. Add the `p` suffix to a value to enter it in ppm (see last example below).

Examples:

```
plgrid
plgrid(2)
plgrid('pen5')
plgrid(1.5,'pen2')
plgrid(1p,0.5p,3p,0.5p)
```

See also: *NMR Spectroscopy User Guide*

Related:

grid	Draw a grid on a 2D display (C)

plh — Plot proton spectrum (M)

Syntax: `plh<(pltmod)>`

Description: Plots a proton spectrum based on the parameters `pltmod` (the options `'off'`, `'fixed'`, `'full'`, and `'variable'` are implemented) and `intmod` (`'off'`, `'full'`, and `'partial'` are implemented).

Arguments: `pltmod` is an alternate value of the parameter `pltmod` for this macro only. The value of the `pltmod` parameter is not changed.

Examples:

```
plh
plh('full')
```

See also: *NMR Spectroscopy User Guide*

Related:

intmod	Integral display mode (P)
pltmod	Plotter display mode (P)
sp	Start of plot (P)
wp	Width of plot (P)

plhet2dj — Plot heteronuclear J-resolved 2D spectra automatically (M)

Syntax: `plhet2dj<('pos'|'neg'<,levels<,spacing<,exp1D>>>)>`

Description: Automatically plots 2D spectra of type HET2DJ (heteronuclear J-resolved 2D spectra) with the following features:

- Displayed portion of the spectrum is plotted in f2-mode
- Plot area is optimized
- Number of contour levels and their spacing can be selected
- Negative or positive contours can be suppressed
- A 1D trace can be plotted along the f_2 axis; such a 1D trace is taken from a full (or reduced) 1D spectrum in an other experiment, or from a file from within the current experiment.
- Expansions are handled correctly
- The 1D trace can be suppressed, which allows using a larger area for the 2D spectrum
- The 1D spectrum can be in any experiment
- With phase-sensitive spectra, if `'pos'` or `'neg'` are not selected and the plotter has only one pen (also for printers like the LaserJet), the specified number of positive contours are plotted (default is 7), but only one negative level, to distinguish positive and negative signals.

In multiexperiment mode, for the first plot the experiment with the 1D spectrum should be specified (at least if it is not in exp1). From then on, the 1D spectrum is stored *within* the experiment with the 2D spectrum, which allows much faster switching between the spectra and also frees the other 1D experiment for other tasks. Because of this internal storage, the `exp1D` argument is not required for subsequent plots.

Arguments: `'pos'` is a keyword to only plot positive contours

`'neg'` is a keyword to only plot negative contours

`levels` is the number of contour levels. The default is 7.

`spacing` is the spacing between the contours. The default is 2.

`exp1D` is the number from 1 to 9 of the experiment in which the 1D spectrum resides. This can be a full 1D spectrum, but the referencing must be the same as for the 2D. A negative number will suppress the 1D trace. The default is 1 (for `exp1`).

Examples:
```
plhet2dj
plhet2dj(12,1.5)
plhet2dj('pos',7,2,3)
plhet2dj(7,2,-1)
```

See also: *NMR Spectroscopy User Guide*

plhom2dj — Plot homonuclear J-resolved 2D spectra automatically (M)

Syntax:
(1) `plhom2dj<(levels<,spacing<,exp1D>>)>`
(2) `plhom2dj('pos'|'neg'<,levels<,spacing<,exp1D>>>)`

Description: Automatically plots 2D spectra of type HOM2DJ (homonuclear J-resolved 2D spectra). Features include the following:

- The displayed portion of the spectrum is plotted in f2-mode
- The plot area is optimized
- Number of contour levels and their spacing can be selected
- Negative or positive contours can be suppressed

- A 1D trace can be plotted along the f_2 axis; such a 1D trace is taken from a full (or reduced) 1D spectrum in an other experiment, or from a file from within the current experiment.
- It also works correctly for expansions
- The 1D trace can be suppressed, which allows using a larger area for the 2D spectrum
- The 1D spectrum can be in any experiment
- With phase-sensitive spectra, if `'pos'` or `'neg'` are not selected and the plotter has only 1 pen (also for printers like the LaserJet) 7 or the specified number of positive contours are plotted, but only one negative level, to distinguish positive and negative signals.

In multiexperiment mode, for the first plot the experiment with the 1D spectrum should be specified (at least if it is not in `exp1`). From then on, the 1D spectrum will be stored *within* the experiment with the 2D spectrum, which allows much faster switching between the spectra and also frees the other (1D) experiment for other tasks. Because of this internal storage, the `exp1D` argument is not required for subsequent plots.

Arguments: `levels` is the number of contour levels. The default is 7.

`spacing` is the spacing between the contours. The default is 2.

`exp1D` is a number from 1 to 9 for the experiment in which the 1D spectrum resides. The spectrum can be a full 1D spectrum but the referencing must be the same as for the 2D. A negative number will suppress the 1D trace. The default is 1 (for `exp1`).

`'pos'` specifies only plot positive contours.

`'neg'` specifies only plot negative contours.

Examples:
```
plhom2dj
plhom2dj(25,1.2)
plhom2dj('pos',7,2,3)
plhom2dj(7,2,-1)
```

See also: *NMR Spectroscopy User Guide*

plhxcor — Plot X,H-correlation 2D spectrum (M)

Syntax:
```
plhxcor(<'pos'|'neg'><,><levels<,spacing
   <,exp1D_H<,exp1D_X>>>>)
```

Description: Automatically plots 2D spectra of type HETCOR, COLOC, HMQC, HMBC (direct and indirect detection). Features include the following:

- Keeps the orientation (f_1, f_2) of the spectrum on the screen.
- Plot area is optimized.
- Number of contour levels and their spacing can be selected.
- Negative or positive contours can be suppressed.
- 1D proton and X traces can be plotted along both axes; such 1D traces are taken from full (or reduced) 1D spectra in other experiments or subfile within the current experiment.
- Works correctly for expansions.
- 1D traces can be suppressed, allowing a larger area for the 2D spectrum.
- 1D spectra can be in any experiment.

Arguments: `'pos'` is a keyword to plot only positive contours.

`'neg'` is a keyword to plot only negative contours.

`levels` is the number of contour levels. The default is 7.

`spacing` is the spacing between the contours. The default is 2.

`exp1D_H` is a number from 1 to 9 of the experiment in which the proton 1D spectrum resides; this can be a full 1D spectrum, but the referencing must be the same as for the 2D. A negative number will suppress the proton trace. The default is a subfile in the current experiment.

`exp1D_X` is a number from 1 to 9 of the experiment in which the X 1D spectrum resides. A negative number suppresses the X trace. the default is a subfile in the current experiment.

Examples:
```
plhxcor(12,1.5)
plhxcor(7,2,3)
plhxcor(7,2,1,3)
plhxcor('pos',7,2,-1,3)
plhxcor(7,2,-1,-1)
plhxcor('neg')
```

See also: *NMR Spectroscopy User Guide*

Related: `hetcor` Set up parameters for HETCOR pulse sequence (M)

pll — Plot a line list (M)

Syntax: `pll<(x,y,minimum_y)>`

Description: Produces a columnar line list on a plotter, similar to what would appear on a printer. `pll` is quite different from the alternative method of plotting peak frequencies using `ppf`. The output of `pll` is automatically formatted into multiple columns, depending on the number of lines.

Arguments: `x` is the *x* position of the upper left of the line list.

`y` is the *y* position of the upper left of the line list.

`minimum_y` is the minimum *y* at which to reset back to top.

Examples:
```
pll
pll(20,150)
pll(5,wc2max*.8,wc2max*.5)
```

See also: *NMR Spectroscopy User Guide*

Related: `ppf` Plot peak frequencies over spectrum (M)

pll2d — Plot results of 2D peak picking (C)

Syntax: `pll2d<(options)>`

Description: Plots the results of applying the `ll2d` command to pick 2D peaks in a 2D spectrum or a 2D plane of a 3D spectrum. Refer to the description of `ll2d` for a description of the process and the options available.

See also: *NMR Spectroscopy User Guide*

Related: `ll2d` Automatic and interactive 2D peak picking (C)

plockport — Port number to use to lock out multiple ProTune processes (P)

Syntax: `plockport=<value>`

Description: The parameter must be created as a real local parameter before it can be used. The parameter is used to override a default port number that is used internally in ProTune to prevent two Java ProTune process from running simultaneously.

Related:

protune	Macro to start ProTune (M)
create	Create new parameter in a parameter tree (C)

plot — Automatically plot spectra (M)

Description: A universal plotting macro normally called through the procplot macro (which by itself serves as processing and plotting facility for automatic experiments). plot can also be used directly by the user who then doesn't have to remember specific plotting macros. Of course, the specialized macros can still be called directly if the user know their names.

The main purpose of plot is to automatically call the correct specialized plotting macro, depending on the user definition or otherwise on the type of data in the experiment. A plotting macro is selected automatically as follows:

APT spectra:	plapt
other, non-arrayed 1D data:	plot1d
DEPT type arrayed spectra:	pldept
other arrayed 1D spectra:	plarray
J-resolved 2D spectra:	pl2dj
homonuclear correlation 2D spectra:	plcosy
heteronuclear correlation 2D spectra:	plhxcor

Other types of 2D spectra (mostly multiple-quantum 2D spectra such as 2D-INADEQUATE) are not plotted automatically at this time. For phase-sensitive 2D spectra, automatic plotting is only provided if they were acquired using the method described by States, Haberkorn, and others; TPPI spectra are not covered.

Note that plot macros in general should not adjust the phase, the vertical scale, or change the integral size and reset points; these are assumed to be adjusted either by hand or by a suitable processing macro like procplot and the macros called therein. The plotting macros only make adjustments in order to make spectrum and parameters fit onto the page the desired way.

See also: *NMR Spectroscopy User Guide*

Related:

apptype	Application type (P)
execpars	Set up the exec parameters (M)
execplot	Execute plotting macro (P)
plapt	Plot APT spectra (M)
plarray	Plot arrays (M)
plcosy	Plot homonuclear 2D correlation spectra (M)
pldept	Plot DEPT type spectra (M)
plhxcor	Plot heteronuclear correlation spectra (M)
plot1d	Plot 1D spectra (M)
plt2Darg	Plot 2D arguments (P)
procplot	Automatically process FIDs (M)

plot1d — Plotting macro for simple (non-arrayed) 1D spectra (M)

Description: A generic macro for plotting non-arrayed 1D spectra using a set of standard macros. plot1d is called by the plot macro, but can also be used directly. plot1d first tries to find a specific macro (e.g., plh, plc, plp) for the current observe nucleus. If such a macro exists, it is called. If a nucleus-specific macro is not found in the command path, a “minimal” 1D plot is produced.

See also: *NMR Spectroscopy User Guide*

Related:

plc	Plot carbon spectrum (M)
plh	Plot proton spectrum (M)
plp	Plot phosphorus spectrum (M)
plot	Automatically plot spectra (M)

plot2D — Plot 2D spectra (M)

Syntax:
```
plot2D('pos'|'neg'|'both',levels,spacing,    \
   'top'|'notop'|'proj','side'|'noside'|'proj')
```

Description: Checks for the presence of appropriate proton or carbon high-resolution spectra in the directory `userdir+'/data/'+sample` and decides to plot high resolution spectra or a projection depending on whether or not the proton or carbon spectrum exists.

Arguments: The `plot2D` macro accepts the following arguments:

'pos'	keyword to plot positive contours
'neg'	keyword to plot negative contours.
'both'	keyword to plot both positive and negative contours.
levels	number of levels to be plotted.
spacing	spacing between contour levels.
'top'	keyword to plot a high-resolution spectrum on the top.
'notop'	keyword to plot a non-high-resolution spectrum or projection.
'proj'	keyword to plot a projection on top.
'side'	keyword to plot a high-resolution spectrum on the side.
'noside'	keyword to plot a non-high-resolution spectrum or projection.
'proj'	keyword that plots a projection on the side.

Examples:
```
plot2D('pos',2,5,'top','side')
```

See also: *NMR Spectroscopy User Guide*

Related:

plot	Automatically plot spectra (M)
plotside	Plot spectrum on side (M)
plottop	Plot spectrum on top (M)
plottopside	Plot spectrum on top and side (M)

plotfile — Plot to a file (M)

Syntax:
```
plotfile('argument')
```

Description: plots automatically to a file. Supported output formats are: `ps`, `pdf`, `jpg`, `pcl`, `hpgl`. and `png`.

Arguments: `auto` — plots automatically.

`manual` — plots contents of printer queue to a file.

`Path and file name` — plots to specified file in the directory specified. Plots to the data directory using the supplied name if no path is specified.

Examples: `plotfile('xxx.fid/myplotfile.PDF')` plots will go into saved data directory.

`plotfile('myplotfile.PDF')` - plots will go to `vnmrsys/plots` if FID has not been saved.

P

plothiresprep High resolution plot output preparation (M)

Description: Required for the operation of the "Plot HiRes..." popup window to interactively use plottop/plotside of spectra in work spaces EXPn - creates necessary variables.

plotmanual Plot manually (M)

Description: Makes correct choice of printer (for preview) and correct alignment with respect to parameter output, resets back screen to original size & position based on selections made on the Plot page.

plotlogo Plots a logo (M)

Description: Plots a logo Varian logo using image file located in `/vnmr/iconlib/varianlogo.gif` or a custom logo from location specified in the parameter `plotlogo`.

Reads value for `doplotlogo` (`n/y`), `plotlogox` (x dimension image), and `plotlogoy` (y dimensions image), and image file in `iconlib`.

plotpreview Creates temporary plots of the current plot output (M)

Syntax: `plotpreview<('argument')>`

Description: Creates preview of the output from auto-plotting the current spectrum and starts an Acrobat PDF reader. The preview output can be saved in PS, PDF, PCL, HPGL, JPG or PNG formats.

Arguments: `no argument` — creates preview of whatever is ready to send to the plotter.

`auto` — creates preview of auto-plot based upon plot macro

`manual` — creates preview of the contents of the print queue.

plotside Plot spectrum on side (M)

Description: Plots projection or high-resolution spectrum on the side of a 2D spectrum. `plotside` is used with `plot2D` and is not useful by itself.

See also: *NMR Spectroscopy User Guide*

Related: `plot2D` Plot 2D spectra (M)

plotter Plotter device (P)

Description: Sets the plotter in use on the system.

Values: A string with entries such as `'DraftPro'`, `'ThinkJet_96'`, `'LaserJet_300'`, `'jim'`, `'varian1'`, and `'Laser1'`.

See also: *NMR Spectroscopy User Guide*

Related: `setplotdev` Return characteristics of a named plotter (C)
`showplotter` Show list of currently defined plotters and printers (M)

plottop Plot spectrum on top (M)

Description: Plots projection or high resolution spectra on the top of a 2D spectrum. `plottop` is used with `plot2D` and is not useful by itself.

See also: *NMR Spectroscopy User Guide*

Related: `plot2D` Plot 2D spectra (M)

plottopside — Plot spectrum on top and side (M)

Description: Plots projection or high-resolution spectrum on the top and side of a 2D spectrum. `plottopside` is used with `plot2D` and is not useful by itself.

See also: *NMR Spectroscopy User Guide*

Related:

`plot2D`	Plot 2D spectra (M)

plp — Plot phosphorus spectrum (M)

Syntax: `plp<(pltmod)>`

Description: Plots a phosphorus spectrum based on the parameters `pltmod` (the options `'off'`, `'full'`, and `'fixed'` are implemented) and `intmod` (`'off'`, `'full'`, and `'partial'` are implemented). Peak frequency labels, in ppm, are usually plotted.

Arguments: `pltmod` is an alternate value of `pltmod` for this macro only. The value of the `pltmod` parameter is not changed.

Examples:

```
plp
plp('full')
```

See also: *NMR Spectroscopy User Guide*

Related:

`intmod`	Integral display mode (P)
`plh`	Plot proton spectrum (M)
`pltmod`	Plotter display mode (P)

plplanes — Plot a series of 3D planes (M)

Syntax:

```
plplanes(start_plot,stop_plot<,'pos'|'neg'>
   <,number_levels><,spacing>)
```

Description: Creates the 2D contour plots for a subset of the 3D planes specified by the parameter `plane`.

Arguments: `start_plot` specifies the number, greater than 0, of the 3D plane with which plotting is to begin.

`stop_plot` specifies the number of the 3D plane with which plotting is to end. If `start_plot` is greater than `stop_plot`, only the first plane, whose number is `start_plot`, is plotted. The range of `stop_plot` depends on the value of the parameter `plane`:

- if `plane='f1f3'`, `stop_plot` is between `0` and `fn2/2`
- if `plane='f2f3'`, `stop_plot` is between `0` and `fn1/2`
- if `plane='f1f2'`, `stop_plot` is between `0` and `fn/2`

`'pos'` is a keyword specifying that phase-sensitive spectra plot positive peaks only. The default is to plot both positive and negative peaks.

`'neg'` is a keyword specifying that phase-sensitive spectra plot negative peaks only. The default is to plot both positive and negative peaks.

`levels` is maximum number of contour levels to plot. The default is 4.

`spacing` is relative intensity of successive contour levels. The default is 2.

Note that the optional arguments `'pos'|'neg'`, `number_levels`, and `spacing` are for the VnmrJ plotting command `pcon`.

Examples:

```
plplanes(1,3)
plplanes(2,3,'pos',4)
```

See also: *NMR Spectroscopy User Guide*

Related:

dplane	Display a 3D plane (M)
dproj	Display a 3D plane projection (M)
dsplanes	Display a series of 3D planes (M)
getplane	Extract planes from 3D spectral data set (M)
nextpl	Display the next 3D plane (M)
path3d	Path to currently displayed 2D planes from a 3D data set (P)
pcon	Plot contours on a plotter (C)
plane	Currently displayed 3D plane type (P)
prevpl	Display the previous 3D plane (M)

plt2Darg Plot 2D arguments (P)

Applicability: Liquids

Description: Specifies options for contours and 1D projections on 2D plots, used by the plot2D macro. The plot options are selected on the Defaults page in the Acquire folder for most 2D sequences.

Related:

plot2D	Plot 2D spectra (M)

pltext Plot text file (M)

Syntax:
```
pltext<(<file><,x<,y<,width>>>)>
  <:$x_next,$y_next,$y_increment>
```

Description: Plots a text file.

Arguments: `file` is the name of a text file. The default is the current experiment text file.

`x` and `y` are coordinates, in mm, of the first line of text. This positions the location of the output. The default is the upper left-hand corner of the page.

`width` is the maximum column text width, in characters. `pltext` uses a word wrap to make the text fit into the width specified.

`$x_next` and `$y_next` are the coordinates where the start of the next line would have been plotting. This is useful for subsequent character plotting.

`$y_increment` is the vertical increment between lines.

Examples:
```
pltext
pltext(wcmax-70)
pltext(userdir+'/exp3/text')
pltext(100,100)
pltext(userdir+'/exp4/text',200,200,24)
pltext:$x,$y,$dy
```

See also: *NMR Spectroscopy User Guide*

Related:

dtext	Display a text file in the graphics window (C
ptext	Print out a text file (M)
text	Display text or set new text for current experiment (C)
userdir	User directory (P)

pltmod Plotter display mode (P)

Description: Controls plotting of a proton, carbon, or phosphorus spectrum.

Values: `'off'` sets no plotting.

`'fixed'` takes `sp` and `wp` as is.

`'full'` adjusts `sp` and `wp` to plot the full spectrum.

'variable' adjusts sp and wp to plot only the region of interest.

See also: *NMR Spectroscopy User Guide*

Related:

plc	Plot carbon spectrum (M)
plh	Plot proton spectrum (M)
plp	Plot phosphorus spectrum (M)
sp	Start plot (P)
wp	Width of plot (P)

plvast — Plot VAST data in a stacked 1D-NMR matrix format (M)

Applicability: Systems with the VAST accessory.

Syntax: plvast<(display order, number of columns plotted)>

Description: plvast arranges and plots the traces from a reconstructed 2D data set (see vastglue)as an array of 1D spectra in a convenient format (as a matrix of 1D spectra). If no arguments are provided, the number of rows and columns are determined by the periodicity of the display order. For example, if a block of 96 spectra, as is typical for a microtiter-plate, have been acquired using VAST automation, the spectra is plotted in a matrix 8 rows and 12 columns.

The default is to plot the spectra from 1 through arraydim (the number of spectra in the 2D data set). An optional argument (plvast(##)) allows one to specify that only spectra from 1 through ## should be plotted.

Arguments: display order is optional and its default value is the glue order as listed in glueorderarray.

number of columns plotted. The default value of is deduced by examining the periodicity of the requested display order. The number of columns plotted can entered as the second argument or as the first argument if the default display order is used.

Examples:

```
plvast
plvast(12)
plvast('glue_file', 4)
```

See also: *NMR Spectroscopy User Guide*

Related:

dsast2d	Display VAST data in a pseudo-2D format (M)
dsvast	Display VAST data in a stacked 1D-NMR matrix (M)
plvast2d	Plot VAST data in a pseudo-2D format (M)
plate_glue	define a display order (U)

plvast2d — Plot VAST data in a stacked pseudo-2D format (M)

Applicability: Systems with the VAST accessory.

Syntax: plvast2d<(number)>

Description: If an array of 1D spectra have been acquired (in particular if a block of 96 spectra has been acquired using VAST automation, especially in a microtiter-plate format) and if these spectra have been glued into a reconstructed 2D dataset (see vastglue), plvast2d will arrange and plot them (on the plotter) in a convenient pseudo-2D format (almost like an LC-NMR chromatogram). Well labels are not attached to the spectra and spectra are plotted with 12 spectra per row.

Arguments: number specifies that only spectra from 1 through number should be plotted. The default is to plot all the spectra (from 1 through arraydim).

See also: *NMR Spectroscopy User Guide*

Related:

dsast2d	Display VAST data in a pseudo-2D format (M)
dsvast	Display VAST data in a stacked 1D-NMR matrix (M)
plvast	Plot VAST data in a stacked 1D-NMR matrix (M)

plww — Plot spectra in whitewash mode (C)

Syntax: `plww<(start,finish,step><,'all'>)>`

Description: Plots one or more spectra in whitewash mode (after the first spectra, each spectra is blanked out in regions in which it is behind an earlier spectra).

Arguments: `start` — index of the first spectra when plotting multiple spectra. It is also the index number of a particular trace to be plotted when plotting arrayed 1D spectra or 2D spectra. The default is to plot all spectra.

`finish` — index of the last spectra when plotting multiple spectra.

`step` — increment for the spectral index when plotting multiple spectra, default is 1.

`'all'` — (default) keyword to plot all spectra in the array.

See also: *NMR Spectroscopy User Guide*

Related:

dss	Display stacked spectra (C)
dsww	Display spectra in whitewash mode (C)
pl	Plot spectra (C)

pmode — Processing mode for 2D data (P)

Description: Specifies the type of 2D spectral data that the 2D Fourier transform (FT) will yield. `pmode` is in the processing group.

Values: `''` (null string, shown by two single quotes with no space in between) specifies a processing mode in which it is not possible to change either the f_2 or f_1 display mode after the 2D FT. If the f_2 display mode has been set to phased (`dmg='ph'`), each f_2 spectrum is phase rotated using the phase constants `rp` and `lp` prior to the FT along the second dimension. If the f_2 display mode has been set to power (`dmg='pwr'`) or absolute-value (`dmg='av'`), however, the f_2 spectrum is not processed any further after the first FT. The complex t_1 interferograms are handled in a similar manner. If the f_1 display mode has been set to phased (`dmg1='ph1'`), each f_1 spectrum is phased using the phase constants `rp1` and `lp1`. If the display mode has been set to power (`dmg1='pwr1'`) or to absolute value (`dmg1='av1'`), the appropriate magnitude calculation is performed, with the result being placed in the real part of the appropriate complex datum and a 0 being placed in the imaginary part. At the end of the 2D transform, the spectral data file `datdir/data` is reduced from complex data to real data ("VnmrJ REDUCE" display message).

`'partial'` specifies a processing mode in which it is not possible to change the f_2 display mode after the 2D FT. It is possible, however, to select between the three f_1 display modes without having to reprocess the 2D data. If the f_2 display mode has been set to phased (`dmg='ph'`), each f_2 spectrum is phase rotated using the phase constants `rp` and `lp` prior to FT along the second dimension. If the f_2 display mode is set to power (`dmg='pwr'`) or absolute value (`dmg='av'`), the f_2 spectrum is not processed any further after the first FT. Regardless of the requested f_1 display mode, no further processing is performed by `ft2d` on the f_1 spectra after the second FT. The calculations on 2D spectral data necessary to achieve the requested f_1 display mode are performed by `dcon` or `dconi`. If `pmode` does not exist, it is assigned a value of `'partial'` internal to VnmrJ.

'full' specifies a processing mode in which it is possible to select between the three display modes for each dimension without having to reprocess the 2D data. Regardless of any requested display mode, no display mode processing is performed by ft2d on the f_2 spectra after the first or second FT.

The hypercomplex data structure for the 2D time domain data is:

```
{Re(t1)Re(t2), Re(t1)Im(t2), Im(t1)Re(t2),
   Im(t1)Im(t2)}
```

and is experimentally composed by the pulse sequence generation arraying mechanism. The hypercomplex data structure for the t_1 interferograms is:

```
{Re(t1)Re(F2), Re(t1)Im(F2), Im(t1)Re(F2),
   Im(t1)Im(F2)}
```

where Re represents the real part and Im represents the imaginary part. A hypercomplex FT along t_1 yields a hypercomplex 2D spectrum with the following data structure per hypercomplex point:

```
{Re(F1)Re(F2), Re(F1)Im(F2), Im(F1)Re(F2),
   Im(F1)Im(F2)}
```

Note that if pmode='full', the ft2d program will require an array index or coefficients for the construction of the t_1 interferograms.

See also: *NMR Spectroscopy User Guide*

Related:

av	Set abs. value mode in directly detected dimension (C)
av1	Set abs. value mode in 1st indirectly detected dimension (C)
dcon	Display noninteractive color intensity map (C)
dconi	Interactive 2D data display (C)
dmg	Data display mode in directly detected dimension (P)
dmg1	Data display mode in 1st indirectly detected dimension (P)
ft1d	Fourier transform along f_2 dimension (C)
ft2d	Fourier transform 2D data (C)
ph	Set phased mode in directly detected dimension (C)
ph1	Set phased mode in indirectly detected dimension (C)
pwr	Set power mode in directly detected dimension (C)
pwr1	Set power mode in 1st indirectly detected dimension (C)
wft1d	Weight and Fourier transform 2D data (C)
wft2d	Weight and Fourier transform 2D data (C)

poly0 — Display mean of the data in regression.inp file (M)

Description: Calculates and displays the mean of data in the file regression.inp.

See also: *User Programming*

Related:

averag	Calculate average and standard deviation of input (C)
expl	Display exponential or polynomial curves (C)

pp — Decoupler pulse length (P)

Description: Sets the decoupler pulse length for use by pulse sequences such as DEPT, HET2DJ, and HETCOR.

See also: *NMR Spectroscopy User Guide*

Related:

AC1-AC9	Automatic calibration (M)
Dept	Set up parameters for DEPT experiment
dhp	Decoupler high-power control with class C amplifier (P)
dpwr	Power level for first decoupler with linear amplifier (P)
hetcor	Set up parameters for HETCOR pulse sequence (M)

p1	First pulse width (P)
pw	Pulse width (P)

ppa — Plot a parameter list in plain English (M)

Syntax: `ppa<(x<,y>)>`

Description: Plots parameters in plain English (instead of in a table with parameter names and their values as plotted by the parameter pap).

Arguments: `x` controls the *x* offset, in mm, from the lower left of the plot to the starting position (upper left) of the parameter list. The default is a preset position on the page (upper left corner).

`y` controls the *y* offset, in mm, from the lower left of the plot to the starting position (upper left) of the parameter list. Default is a preset position on the page (upper left corner).

Examples:
```
ppa
ppa(10)
ppa(wcmax-80,wc2max*.9)
```

See also: *NMR Spectroscopy User Guide*

Related:

bpa	Plot boxed parameters (M)
hpa	Plot parameters on special preprinted chart paper (C)
pap	Plot out “all” parameters (C)
pltext	Plot a text file (M)

ppcal — Proton decoupler pulse calibration (M)

Description: Proton decoupler pulse calibration for DEPT, HETCOR, INEPT, etc.

See also: *NMR Spectroscopy User Guide*

Related:

AC1S-AC11S	Automatic calibration (M)
d2pul	Set up parameters for D2PUL pulse sequence (M)
Dept	Set up parameters for DEPT experiment
hetcor	Set up parameters for HETCOR pulse sequence (M)
inept	Set up parameters for INEPT pulse sequence (M)

ppf — Plot peak frequencies over spectrum (C)

Syntax:
(1) `ppf<(<'noll'><,'pos'><,noise_mult><,'top'>)>`
(2) `ppf<(<'noll'><,'pos'><,noise_mult><,'leader'><,length>)>`

Description: Plots peak frequencies, in units specified by the axis parameter, in the plotter device. Only those peaks greater than th high are selected. Two basic modes of label positioning are available: labels placed at the top, with long “leaders” extending down to the tops of the lines (syntax 1 using the `'top'` keyword), or labels positioned just above each peak, with short leaders (syntax 2 using the `'leader'` keyword). The default is short leaders.

Arguments: `'noll'` is a keyword to plot frequencies using the last previous line listing.

`'pos'` is a keyword to plot positive peaks only (`'noneg'` is the same as `'pos'`).

`noise_mult` is a numerical value that determines the number of noise peaks plotted for broad, noisy peaks. The default is 3. A smaller value results in more peaks, a larger value results in fewer peaks, and a value of 0.0 results in a line listing containing all peaks above the threshold th. Negative values of

noise_mult default to 3. The noise_mult argument is inactive when the 'noll' keyword is specified.

'top' is a keyword to plot labels at the top with long leaders. In this mode, the height of labels is varied by changing the parameter wc2.

'leader' is a keyword to plot labels positioned just above each peak with short leaders.

length specifies the leader length, in mm, if labels are positioned just above each peak. The default length is 20 mm.

Examples:
```
ppf('pos')
ppf('leader',30)
ppf('top','noll')
ppf('pos',0.0,'leader',30)
```

See also: *NMR Spectroscopy User Guide*

Related:

axis	Axis label for displays and plots (P)
dpf	Display peak frequencies over spectrum (C)
dpir	Display integral amplitudes below spectrum (C)
dpirn	Display normalized integral amplitudes below spectrum (M)
pir	Plot integral amplitudes below spectrum (C)
pirn	Plot normalized integral amplitudes below spectrum (M)
th	Threshold (P)

pph — Print pulse header (M)

Syntax: `pph(file)`

Description: Prints out the shape file header (i.e., all lines starting with #).

Arguments: file is the name of the shape file, including the extension.

Examples:
```
pph('shgrad.GRD')
```

See also: *NMR Spectroscopy User Guide*

Related:

Pbox	Pulse shaping software (U)

ppmm — Resolution on printers and plotters (P)

Description: An internal software parameter, selected automatically based on the plotter configuration, that contains the resolution in dots/mm on raster graphics printers. On pen plotters, ppmm contains the resolution of points drawn. On PostScript printers, ppmm adjusts linewidths.

pprofile — Plot pulse excitation profile (M)

Syntax: `pprofile<(axisflag<,profile<,shapefile>>)>`

Description: Plots the X, Y and Z excitation (inversion) profile for a pulse shape that has been generated with the Pbox software. If shape names is not provided, the last simulation data stored in the shapelib/pbox.sim file are plotted.

Arguments: The axisflag and profile arguments can be given in any order.

axisflag is 'y' to display the full spectrum and a frequency scale, or 'n' to suppress the scale and spectrum. The default is 'n'.

profile is a character string identifying the desired profile. 'xyz' selects X, Y, and Z (inversion) profiles; 'xy' selects only the excitation (transverse) profiles; 'x' selects only the X transverse excitation profile; and 'z' selects only the inversion profile. The default is 'xyz'.

shapefile is the name of a *.RF or *.DEC file, including the extension.

Examples:
```
pprofile
pprofile('y','x')
pprofile('xy','n','softpls.RF')
```

See also: *NMR Spectroscopy User Guide*

Related:

dprofile	Display pulse excitation profile (M)
Pbox	Pulse shaping software (U)

pps — Plot pulse sequence (C)

Syntax: `pps<(file<,x,y,width,height>)>`

Description: Plots pulse sequences. The plotted picture consists of three to five parts. At the top is the transmitter pulse sequence. Below that is the decoupler pulse sequence. Next is the second decoupler pulse sequence or gradients, depending on the program. At the bottom is the status.

The parameter of each pulse is plotted if its length is less than 30 letters. The value of each pulse is also plotted. If its value is less than zero, a question mark "?" is plotted. The time units are displayed as letters (s, m, or u). The height of pulses are plotted according to their power level.

Arguments: `file` specifies the pulse sequence to be plotted. The default is `seqfil`.

`x,y` specifies the start of the plotting position with respect to the lower-left corner of the plotter.

`width,height` are in proportion to `wcmax` and `wc2max`.

Examples:
```
pps
pps('s2pul')
pps(3,50)
```

See also: *NMR Spectroscopy User Guide*

Related:

dps	Display pulse sequence (C)
seqfil	Pulse sequence name (P)
wcmax	Maximum width of chart (P)
wc2max	Maximum width of chart in second direction (P)

prealfa — Specify a delay for longer ring down (P)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Specify a delay to be used in situations when there is a longer ring down of rf following the last rf pulse.

This parameter is only active when `qcomp='y'`. `prealfa` should be created as a local parameter of type `pulse` or `delay`. This parameter must be created as a local parameter of the type `pulse` for SpinCad Sequences.

If it is desired to use the software computed value for this delay, destroy the `prealfa` parameter.

Values: User set `prealfa` value that may be slightly adjusted by the software to better optimize the DSP parameters.

prep — Run prepare acquisition macro (M)

Applicability: Imaging

Description: Run the prepare acquisition macro specified by the `execprep` parameter. Usually only called from panels.

Related:

execprep	Execute prepare macro (P)

Presat — Set up parameters for presat ^{1}H experiment (M)

Description: Set up parameters for presat ^{1}H experiment with solvent suppression.

prevpl — Display the previous 3D plane (M)

Description: Displays 2D color map of the previous 3D plane in the set of planes defined by the parameters `plane` and `path3d`. For example, if `dplane(40)` has just been executed, `prevpl` results in the display of 3D plane 39 of that set. (If `prevpl` immediately follows the command `dproj`, an error results because there is no 3D plane whose number is –1.) `prevpl` is more efficient than `dplane` or `dproj` because the 3D parameter set (`procpar3d`) is not loaded into VnmrJ. It is assumed to have already been loaded by, for example, `dplane` or `dproj`.

See also: *NMR Spectroscopy User Guide*

Related:

`dplane`	Display a 3D plane (M)
`dproj`	Display a 3D plane projection (M)
`dsplanes`	Display a series of 3D planes (M)
`getplane`	Extract planes from a 3D spectral data set (M)
`nextpl`	Display the next 3D plane (M)
`path3d`	Path to currently displayed 2D planes from a 3D data set (P)
`plane`	Currently displayed 3D plane type (P)
`plplanes`	Plot a series of 3D planes (M)

prescan — Study queue prescan (P)

Description: This parameter keeps track of the type and status of the prescans in the study queue.

Related:

`cqexp`	Load experiment from protocol (M)
`cqrset`	Reset study queue parameters (M)
`sqexp`	Load experiment from protocol (M)
`sqreset`	Reset study queue parameters for imaging (M)

prescan_CoilTable — Read or update the CoilTable File (M)

Syntax: `prescan_CoilTable(action,rfcoil)`

Description: Manages the CoilTable file in `~/vnmrsys`. Reads information about `rfcoil` into the global parameter `coil_param`; updates/adds information for rfcoil from `coil_param`; removes the `rfcoil` entry from CoilTable.

Arguments: actions for the specified `rfcoil` are:

```
read
add
update
remove
```

Examples: `prescan_CoilTable('read','main')`

prescan_tn — Return tn string for a given atomic number (M)

Syntax: `prescan_tn(number):str`

Description: Returns `tn` string for a given atomic number; for H1, C13, F19, P31, Na23, Xe129 only.

Arguments: `Number` is the atomic number.

`str` is a string that can be assigned to tn.

Examples: `prescan_tn(23):tn`

`printer` **Printer device (P)**

Description: Selects the printer in use on the system.

Values: A string with entries such as `'ThinkJet_96'`, `'LaserJet_300'`, `'jim'`, `'varian1'`, and `'Laser1'`.

See also: *NMR Spectroscopy User Guide*

Related: `showplotter` Show list of currently defined plotters and printers (M)

`printfile` **Path to the print-to-file image (P)**

Description: Defines the path where an image is saved if it is printed to a file.

`printformat` **Format of saved-to-file image (P)**

Description: The format of the image to be printed to a file.

Values: `'jpeg'`,`'gif'`,`'tiff'`,`'bmp'`

`printlayout` **Layout of printed image (P)**

Description: The layout of the printed image.

Values: `'portrait'` or `'layout'`

`printoff` **Stop sending text to printer and start print operation (C)**

Syntax: `printoff<('clear'|file)>`

Description: Stops redirection of output to printer caused by the `printon` command and starts the print operation. **The command `printoff` must be entered to obtain output on the printer.** Actual printing is controlled by the `vnmrprint` script in the `bin` subdirectory of the system directory. `printoff` can also clear the data in the current print file or save data to a specified file name (i.e., print or plot to a file).

Arguments: `'clear'` is a keyword to clear the print file made so far.

`file` specifies the name of a file to save the printout. If the file already exists, it is overwritten.

Examples:
```
printoff
printoff('clear')
printoff('vnmrsys/papers/peaks.list')
```

See also: *NMR Spectroscopy User Guide*

Related:
`printon` Direct text output to printer (C)
`vnmrprint` Print text files (U)

`printon` **Direct text output to printer (C)**

Description: Sends information to the printer that is normally displayed in the text window. After using `printon`, output from commands that use the text window, such as `dg` and `cat`, is sent to the printer and does not appear on the screen. The value of the parameter `printer` is used to select which printer is used.

See also: *NMR Spectroscopy User Guide*

Related:

cat	Output one or more files to output text window (C)
dg	Display group of acquisition/processing parameters (C)
printer	Printer device (P)
printoff	Stop sending text to printer and start print operation (C)

printregion Screen region to be printed (P)

Description: The region of the screen to be printed or saved to a file.

Values: 'vnmrj' -- entire VnmrJ interface.
'graphics' -- the graphics area of the VnmrJ interface.
'frames' -- selected frames from the graphics area.

printsize Size of printed image (P)

Description: The size of the printed image.

Values: 'quarterpage', 'halfpage', 'page'

printsend Defines where image will print (P)

Description: Defines whether the selected image will sent to a file or a printer.

Values: 'file' or 'printer'

probe Probe type (P)

Description: Contains a string with the name of the probe currently in the magnet. This parameter is set automatically when the addprobe macro is entered. The getparam and setparams macros use probe to retrieve and write parameters into the current probe file.

See also: *NMR Spectroscopy User Guide*

Related:

addnucleus	Add new nucleus to existing probe file (M)
addprobe	Create new probe directory and probe file (M)
getparam	Receive parameter from probe file (M)
setparams	Write parameter to current probe file (M)

probeConnect Specify which nucleus can be acquired on each RF channel (P)

Applicability: VNMRS and 400 MR

Syntax: probeConnect = 'nuc1 nuc2 nuc3...'

Description: Global string parameter that does not exist by default. If present, PSG uses it to determine which RF channel to connect to a given nucleus. The string consists of a series of space-separated nuclei. A nucleus 'X' may be used only once in the string to match any nucleus. The parameter must match the hardware connections. If the parameter does not match the hardware connections or does not exist, default settings are used. Default settings are to use the first channel for tn for high band observe, and the second channel for tn for low band observe.

Values: Any nucleus name used for tn, or 'X'.

Examples: create('probeConnect','string','global')

probeConnect = 'H1 C13' maps H1 to channel 1, C13 to channel 2

probeConnect = 'H1 P31 X' maps H1 to channel 1, P31 to channel 2, any nucleus to channel 3.

See also: *VnmrJ User Programming*

Related:

`tn`	Nucleus for observe transmitter (P)
`dm`	Nucleus for first decoupler (P)
`dm2`	Nucleus for second decoupler (P)
`dm3`	Nucleus for third decoupler (P)

`Probe_edit` Edit probe for specific nucleus (U)

Syntax: (UNIX) `Probe_edit probe nucleus`

Description: Opens a dialog box showing all the parameters related to a specific nucleus from the probe table.

Arguments: `probe` is the name of the probe.

`nucleus` is the specified nucleus from the probe table.

Examples:
```
Probe_edit 5mmSW H1
```

Related: `probe_edit` Edit probe for specific nucleus (M)

`probe_edit` Edit probe for specific nucleus (M)

Syntax:
```
probe_edit(probe,nucleus)
```

Description: Opens a dialog box showing all the parameters related to a specific nucleus from the probe table.

Arguments: `probe` is the name of the probe.

`nucleus` is the specified nucleus from the probe table.

Examples:
```
probe_edit('5mmSW','H1')
probe_edit(probe,tn)
```

Related: `Probe_edit` Edit probe for a specific nucleus (U)

`probe_protection` Probe protection control (P)

Description: Controls the power check for probe protection.

See also: *NMR Spectroscopy User Guide*

`proc` Type of processing on np FID (P)

Description: Specifies the type of data processing to be performed upon the `np` (t_2) FID. Similarly, parameters `proc1` and `proc2` specify the type of data processing on the `ni` (t_1) and `ni2` interferograms, respectively.

All Varian data must be processed along `np` with a complex Fourier transform (FT). Sequentially sampled Bruker data (the usual case) must be processed along this dimension with a real FT, while simultaneously sampled Bruker data must be processed with a complex FT.

Pure absorptive 2D data collected by the States-Haberkorn (hypercomplex) method must be processed along `ni` or `ni2` with a complex FT.

Pure absorptive 2D data collected by the TPPI method on a Varian spectrometer can be processed in one of two ways, depending upon how the data was collected:

`phase=3`	Complex FT, i.e., `proc1='ft'` (standard way)
`phase=1,4`	Real FT, i.e., `proc1='rft'` (new way)
`phase2=3`	Complex FT, i.e., `proc2='ft'`
`phase2=1,4`	Real FT, i.e., `proc2='rft'`

Pure absorptive 2D data collected by TPPI method on a Bruker spectrometer must be processed along `ni` with a real FT (i.e., `proc1='rft'`).

Values: `'ft'` specifies complex FT data processing.

`'rft'` specifies real FT data processing.

`'lp'` specifies linear prediction processing on complex data. If `'lp'` is selected, additional parameters must be set to fully define how the time-domain data is to be processed; see the description of the `addpar` command.

See also: *NMR Spectroscopy User Guide*

Related:

`addpar`	Add selected parameters to the current experiment (M)
`ni`	Number of increments in 1st indirectly detected dimension (P)
`np`	Number of data points (P)
`parlp`	Create parameters for linear prediction (C)
`phase`	Phase selection (P)
`phase2`	Phase selection for 3D acquisition (P)
`proc1`	Type of processing on `ni` interferogram (P)
`proc2`	Type of processing on `ni2` interferogram (P)

`proc1` Type of processing on ni interferogram (P)

Description: Specifies the type of data processing to be performed upon the `ni` (t_1) interferogram (2D). Refer to the description of `proc` for further information.

Values: `'ft'` specifies complex Fourier transform (FT) data processing.
`'rft'` specifies real FT data processing.
`'lp'` specifies linear prediction processing on complex data. If `'lp'` is selected, additional parameters must be set to fully define how the time-domain data is to be processed; see the description of the `addpar` command.
`'ht'` specifies Hadamard transform processing. If `'ht'` is selected, additional parameters must be set with the `addpar` command. In addition, the data set must be acquired using a Hadamard pulse sequence.

See also: *NMR Spectroscopy User Guide*

Related:

`addpar`	Add selected parameters to the current experiment (M)
`ni`	Number of increments in 1st indirectly detected dimension (P)
`proc`	Type of processing on `np` FID (P)

`proc1d` Processing macro for simple (non-arrayed) 1D spectra (M)

Description: A generic macro for processing non-arrayed 1D spectra using a set of standard macros. `proc1d` is called by the `procplot` macro, but can also be used directly. `proc1d` first tries to find a macro of the form {`tn`}`p` with the name of the observe nucleus in lower case (e.g., `h1p`, `c13p`). If such a macro exists, it is called. If such a nucleus-specific macro is not found in the command path, minimal 1D processing is performed (the intent is to provide a well-processed spectrum in most cases): Fourier transformation (using pre-set weighting functions), automatic phasing (`aphx` macro), automatic integration (`integrate` macro), vertical scale adjustment (`vsadj` macro), avoiding excessive noise (`noislm` macro), and threshold adjustment (`thadj` macro).

proc1d does not work with arrayed 1D spectra: use deptproc (for DEPT-type spectra) or procarray (for all other arrayed 1D data).

See also: *NMR Spectroscopy User Guide*

Related:

aphx	Perform optimized automatic phasing (M)
c13p	Process 1D carbon spectra (M)
deptproc	Process arrayed dept type spectra (M)
h1p	Process 1D proton spectra (M)
integrate	Automatically integrate 1D spectrum (M)
noislm	Avoids excessive noise (M)
procarray	Process arrayed 1D spectra (M)
procplot	Automatically process FIDs (M)
thadj	Adjust threshold (M)
vsadj	Adjust vertical scale (M)

proc2 — Type of processing on ni2 interferogram (P)

Description: Specifies the type of data processing to be performed upon the ni2 interferogram (3D). Refer to the description of proc for further information.

Values: 'ft' specifies complex Fourier transform (FT) data processing.

'rft' specifies real FT data processing.

'lp' specifies linear prediction processing on complex data. If 'lp' is selected, additional parameters must be set to fully define how the time-domain data is to be processed; see the description of the addpar command.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
ni2	Number of increments in 2nd indirectly detected dimension (P)
proc	Type of processing on np FID (P)

proc2d — Process 2D spectra (M)

Description: A general 2D processing macro that tries to do the appropriate processing for as many types of 2D experiments as possible. It uses wft2da for phase-sensitive spectra, wft2d for absolute-value 2D spectra, wft2d('ptype') for HOM2DJ and COSYPS (absolute value). Symmetric homonuclear correlation spectra (fn=fn1, sw=sw1) in absolute-value mode is symmetrized using foldt. The resulting spectrum is then normalized (adjustment of vs and th) using nm2d and displayed (if not in background mode). proc2d is called as part of the procplot macro, but can also be used directly by the user.

See also: *NMR Spectroscopy User Guide*

Related:

fn	Fourier number in the directly detected dimension (P)
fn1	Fourier number in 1st indirectly detected dimension (P)
foldt	Fold COSY-like spectrum along diagonal axis (C)
nm2d	Normalize intensity of 2D spectrum (M)
procplot	Automatically process FIDs (M)
sw	Spectral width in the directly detected dimension (P)
sw1	Spectral width in the 1st indirectly detected dimension (P)
th	Threshold (P)
vs	Vertical scale (P)
wft2d	Weight and Fourier transform 2D data (C)
wft2da	Weight and Fourier transform for pure absorption 2D data (M)

procarray — Process arrayed 1D spectra (M)

Description: A generic macro for processing arrayed 1D data. It is called within the procplot macro, but can also be called directly. It transforms all traces, phase the trace with the largest signal, scale the traces appropriately, and set up the display parameters such that the data can be plotted directly. The plotting is done in a separate macro plarray that is also called in the procplot macro.

For the display setup, procarray distinguishes between arrays with 6 or less elements, which are stacked vertically (no horizontal offset), and spectra with greater than 6 elements, which are stacked horizontally by default, unless there are too many lines, in which case a diagonally stacked display is chosen.

Horizontal stacking is mostly adequate for pulse and power calibrations, where there are usually only a few lines. Diagonally stacked displays and plots are frequently chosen for T_1 and T_2 experiments on entire spectra, often with many lines. The automatic stacking mode can be overridden by creating and setting a string parameter stackmode in the startup macro, or before calling procplot or procarray. Possible values for stackmode are 'horizontal', 'vertical', and 'diagonal'. DEPT-type spectra can, in principle, be also processed with procarray but, of course, no DEPT editing occurs.

See also: *NMR Spectroscopy User Guide*

Related:

deptproc	Process arrayed dept type spectra (M)
plarray	Plot arrayed 1D spectra (M)
proc1d	Processing macro for simple (non-arrayed) 1D spectra (M)
procplot	Automatically process FIDs (M)
stack	Set stacking control parameter (M)
stackmode	Stack control for processing arrayed 1D spectra (P)

process — Generic automatic processing (M)

Description: Processes a wide range of data types. If the apptype parameter is set, it runs the execprocess macro if it exists. If the apptype parameter is not set it selects a macro depending on the type of data. For simple 1D spectra, process looks for a macro of form {tn}p with the observe nucleus in lower case (e.g., h1p, c13p, f19p). If no such macro is found, process calls proc1d, a generic processing macro for 1D spectra. For DEPT type data, deptproc is called. For other arrays of 1D spectra, procarray is called. For 2D spectra, proc2d is called. process by itself is called within the procplot macro.

See also: *NMR Spectroscopy User Guide*

Related:

apptype	Application type (P)
c13p	Processing of 1D carbon spectra (M)
deptproc	Process array of DEPT spectra (M)
execpars	Set up the exec parameters (M)
execprocess	Execute processing macro (P)
f19p	Processing of 1D fluorine spectra (M)
h1p	Processing of 1D proton spectra (M)
proc1d	Automatically process non-arrayed 1D fids (M)
proc2d	Process 2D spectra (M)
procarray	Process arrayed 1D spectra (M)
procplot	Automatically process FIDs (M)
tn	Nucleus for observe transmitter (P)

procplot — Automatically process FIDs (M)

Syntax: procplot<(pltmod_value)>

Description: Universal FID processing macro called usually with `wexp='procplot'` by automatic acquisition macros such as `h1`, `c13`, `hcapt`, and `hcosy`. The purpose of `procplot` is not the data processing itself, but rather the selection of the appropriate processing macro for a given data set.

First, `procplot` calls a macro `process` that calculates spectra; that macro by itself then selects an appropriate processing macro, like `proc1d` for non-arrayed 1D spectra. Depending whether the parameter `pltmod` is set to `'none'` or not, `procplot` then calls `plot`, a universal plotting macro. The setting of the parameter `pltmod` can be temporarily overridden by specifying an alternative value as argument to `procplot`.

One of the concepts behind `procplot` is that the user should never have to modify any processing macro for customizing the processing or the output of automatic experiments or processing; this outcome can happen by selecting a parameter in the calling macro or before calling `procplot`.

Arguments: `pltmod_value` is an alternate value for the parameter `pltmod` that is only used for the current call. The values `'none'` and `'off'` suppress plotting. The range of possible (active) values for `pltmod_value` depends on the plotting macros. Often, the parameter `pltmod` has no effect other than turning on or off plotting. Note that if only the calculation of a spectrum is desired, it is usually easier to call the `process` macro.

Examples:
```
procplot
procplot('none')
```

See also: *NMR Spectroscopy User Guide*

Related:

`deptproc`	Process arrayed dept type spectra (M)
`plot`	Automatically plot spectra (M)
`pltmod`	Determine plot mode (P)
`proc1d`	Processing macro for simple (non-arrayed) 1D spectra (M)
`proc2d`	Process 2D spectra (M)
`procarray`	Process arrayed 1D spectra (M)
`process`	Automatically calculate spectra (M)

`profile` Set up pulse sequence for gradient calibration (M)

Applicability: Systems with the pulsed field gradients (PFG) module.

Description: Performs an rf and gradient echo sequence that gives a high quality profile of the sample. This sequence is used with the macro `setgcal` to provide gradient strength calibration.

See also: *Performa I Pulsed Field Gradient Module Installation; Pulsed Field Gradient Modules Installation; User Programming*

Related:

`gcal`	Gradient calibration constant (P)
`setgcal`	Calibrate gradient strength from measured data (M)

`proj` Project 2D data (C)

Syntax: `proj(exp_number<,'sum'><,start<,width>>)`

Description: Projects 2D data onto the axis parallel to the screen x-axis, which can be f_1 or f_2, depending upon the parameter `trace`. Two projections are available:

- *Summing projection.* The data at each frequency are summed and the result becomes the projection.
- *Skyline projection.* The data are searched and the maximum intensity at any given frequency becomes the intensity in the projection (similar to looking

at the skyline of a city where only the largest building along any given line of sight is visible).

Phase-sensitive data can be projected, but the resulting projection can only be displayed in an absolute-value mode

Arguments: `exp_number` is the number of the experiment, from 1 through 9, in which the resulting spectrum is stored.

`'sum'` is a keyword to use the summing projection. The default is skyline.

`start` defines the starting trace, in Hz. The default is to project all data.

`width` defines the width of the traces, in Hz, to be projected. The default is to project all data. If `width` is supplied as zero, a single trace corresponding to the `start` frequency will be stored.

Examples:
```
proj(3)
proj(5,'sum')
proj(4,3*sfrq,6*sfrq)
```

See also: *NMR Spectroscopy User Guide*

Related: `trace` Select mode for 2D data display (P)

Proton — Set up parameters for ^{1}H experiment (M)

Description: Set up parameters for ^{1}H experiment.

protune — Macro to start ProTune (M)

Applicability: Liquids, Walkup, Automation

Syntax:
```
protune(freq1 <, match1 <, freq2 <, match2>>>)
protune('argument',<$nucleus,<$target>>)
protune('exec', command1 <, command2, ...>)
```

Description: Tunes to frequency freq1 MHz if the first argument is the frequency in MHz.

Executes a sequence of arbitrary tuning commands if the first argument is the keyword exec. Any command that can be typed into the command line box in the ProTune GUI display is allowed.

Arguments: First case:

`freq1` MHz — first tuning frequency in MHz

`match1` — % of optimum for the first frequency, 5% is the default

`freq2` MHz — optional second tuning frequency in MHz

`match2` — % of optimum for the second frequency, 5% is the default.

Second case:

`'argument'` may have the following values:

no argument or `'popup'`	opens Tune Probe dialog for probe tuning. Select the nucleus to tune and how coarse to tune using the buttons and menus in the dialog box.
`'calibrate'`	open ProTune calibration interface.
`'nucleus'`	tune using specified nucleus – `$nucleus` must be specified.

`$nucleus` — Nucleus to tune to, 'H1', 'C13' …

`$target` — Tune target level, 0.1(finest) to 100 (coarsest), defaults to 5 if no value is specified.

Third case:

`exec` — keyword that precedes a command or string of commands.

Examples: `protune('exec', 'setTuneFrequency 0 599.96e6')`

Tunes the probe to 599.96 MHz.

See also: User Guide Liquids and VnmrJ Walkup

Related:

`atune`	ProTune present (P)
`protunegui`	Macro to start ProTune in graphical user interface (M)
`plockport`	Port number to use to lock out multiple ProTune processes (P)
`probeConnect`	Specify which nucleus can be tuned on each RF channel (P)
`settune`	set up tune parameters for automation
`showprotunegui`	show the graphical interface while tuning (P)
`tchan`	RF channel number used for tuning (P)
`tugain`	Receiver gain used in tuning (P)
`tunehf`	Tune both H1 and F19 on an HFX probe (M)
`tunesw`	Width of the tuning sweep in Hz (P)
`tunematch`	Default match target, in percent of optimum (P)
`tupwr`	Transmitter power used in tuning (P)
`tuneResult`	Message indicating how well the tuning succeeded (P)
`tunemethod`	Method to use for tuning (P)
`wtune`	Specify when to tune (P)
`wtunedone`	What to do after tuning is done (P)
`xmtune`	Check tune parameter during automation (M)

`protune` Shell script for start ProTune operation (U)

Applicability: Automation

Description: Starts and stops ProTune. Usually called from Protune macros.

See also: *NMR Spectroscopy User Guide* and *VnmrJ Walkup*

Related: `protune (M` Macro to start ProTune (M)

`protunegui` Macro to start ProTune in graphical user interface (M)

Applicability: Liquids, VnmrJ Walkup, Automation

Syntax: `protune('argument',<$nucleus,<$target>>)`

Description: Starts ProTune in graphical mode.

Arguments: see `protune (M)`

See also: *NMR Spectroscopy User Guide* and *VnmrJ Walkup*

Related: `protune` Macro to start ProTune (M)

`prune` Prune extra parameters from current tree (C)

Syntax: `prune(file)`

Description: Destroys parameters in the current parameter tree that are not also defined in the supplied parameter file. `prune` is used to remove leftover parameters from previous experimental setups. Recalling a new parameter set into an experiment has a similar effect and, in general, `prune` is not required.

Arguments: `file` is the path of a parameter file.

Examples:

```
prune(systemdir+'/parlib/cosyps.par/procpar')
prune('/vnmr/par400/stdpar/H1.par/procpar')
prune(userdir+'/exp3/curpar')
```

See also: *User Programming*

Related:

create	Create new parameter in a parameter tree (C)
destroy	Destroy a parameter (C)
display	Display parameters and their attributes (C)
fread	Read parameters from file and load them into a tree (C)
fsave	Save parameters from a tree to a file (C)

pscale — Plot scale below spectrum or FID (C)

Syntax: `pscale<(<rev><,axis><,label><,vp0><,sp0><,color><,pen>)>`

Description: Plots a scale under a spectrum or FID.

Arguments: `rev` – reverses the direction of the scale. That is, the smaller numbers will be at the left side of the scale. If used, `'rev'` must be the first argument.

`axis` – If the letter `p`, `h`, `k`, etc. is supplied, it will be used instead of the current value of the parameter `axis`. For an FID scale, if the letter `s`, `m`, or `u` is supplied, it will be used instead of the current value of the parameter `axisf`.

`label` – If a string of 2 or more characters is supplied, it will be used as the axis label.

`vp0` – This is supplied as the first real number. It defines the vertical position where the scale is drawn. The default is 5 mm below the current value of the parameter `vp`.

`sp0` – This is supplied as the second real number. It is a modified start of plot. If, for example, the display is from 347 to 447 hz, but the scale is desired to read 0 to 100 hz., `sp0` would be input as 0.

`wp0` – This is supplied as the third real number. It is a modified width of plot. If, for example, the display is from 347 to 447 hz, but the scale is desired to read 0 to 550 Units. sp0 would be input as 0, `wp0` would be 550, and the label would be 'Units'.

An optional color or pen number can be supplied to `dscale` or `pscale`. The available colors and pens are: `'red'`, `'green'`, `'blue'`, `'cyan'`, `'magenta'`, `'yellow'`, `'black'`,`'white'`
`'pen1'`, `'pen2'`, `'pen3'`,..., `'pen8'`

Examples:

```
pscale
pscale(20)
pscale('h',0,'pen2')
pscale('fid','m')
pscale('h',vp-10,0)
```

See also: *NMR Spectroscopy User Guide*

Related:

axis	Axis label for displays and plots (P)
axisf	Axis label for FID displays and plots (P)
dscale	Display scale below spectrum or FID (C)
vp	Vertical position of spectrum (P)

pseudo — Set default parameters for pseudo-echo weighting (M)

Syntax: `pseudo<(C1,C2,C3,C4)>`

Description: Generates an initial guess at good weighting parameters for absolute-value 2D experiments. To generate modified guesses, four coefficients are allowed to set the values of the weighting functions.

Arguments: `C1` sets `lb=-0.318/(C1*at)`. The default value of `C1` is 0.0625.

`C2` sets `gf=C2*at`. The default value of `C2` is 0.25.

C3 sets lb1=-0.318/(C3*(ni/sw1)) but is used with 2D experiments only. The default value of C3 is 0.0625.

C4 sets gf1=C4*(ni/sw1) but is used with 2D experiments only. The default value of C4 is 0.25.

Examples:
```
pseudo
pseudo(.1,.4,.2,.5)
```

See also: *NMR Spectroscopy User Guide*

Related:
- sinebell — Select default parameters for sinebell weighting (M)

psg — Display pulse sequence generation errors (M)

Description: Helps identify the problem if, after entering go or su, etc., the message is returned that pulse sequence generation (PSG) aborted abnormally. Any parameters that are not found are listed. This information is stored in the user's directory (vnmrsys) in a text file named psg.error. If the message "Maximum communication retries exceeded, Experiment unable to be sent" is displayed, a program communications problem is indicated. Consult the system operator for assistance.

See also: *User Programming*

psggen — Compile a user PSG object library (M,U)

Description: A user PSG (pulse sequence generation) kit is supplied that allows editing low-level pulse sequence code. psggen compiles these edits so that subsequent pulse sequence generation with the seqgen command uses the customized pulse sequence source.

See also: *User Programming*

psgset — Set up parameters for various pulse sequences (M)

Syntax: `psgset(file,par1,par2,...,parN)`

Description: Sets up parameters for various pulse sequences using information in a parlib file. Rather than returning the entire parameter file, psgset returns the parameters listed. psgset, in general, is never entered from the keyboard but is used as part of experiment setup macros.

Arguments: file is the file from the user or system parlib that provides information on setting up the parameters listed. The parameters seqfil and pslabel are set to the supplied file name.

par1,par2,...,pN are 1 to 11 parameters to be returned from parlib.

Examples:
```
psgset('cosy','dg','ap','ss','d1','axis','phase')
```

See also: *User Programming*

Related:
- pslabel — Pulse sequence label (P)
- seqfil — Pulse sequence name (P)

psgupdateon — Enable update of acquisition parameters (C)

Description: Permits the interactive updating of acquisition parameters.

See also: *SpinCAD*

Related:
- psgupdateoff — Prevent update of acquisition parameters (C)
- updtparam — Update specified acquisition parameters (C)

psgupdateoff — Prevent update of acquisition parameters (C)

Description: Prevents the interactive updating of acquisition parameters.

See also: *SpinCAD*

Related:

psgupdateon	Enable update of acquisition parameters (C)
updtparam	Update specified acquisition parameters (C)

pshape — Plot pulse shape or modulation pattern (M)

Syntax: `pshape<(pattern.ext)>`

Description: Plots the real (X) and imaginary (Y) components of a shaped pulse. Any type of waveform (.RF, .DEC or ,GRD) can be plotted.

Arguments: `pattern` is the name of a shape or pattern file specified by an absolute file name, relative file name, or a simple pattern file name. `ext` is a file name extension that specifies the file type. In the case of a simple file name, dshape searches for the file in the local directory, then in the user's `shapelib`, and finally in the directory `/vnmr/shapelib`. If `pattern.ext` is not given, `pshape` displays the last created waveform stored in the `pbox.fid` file.

Examples:

```
pshape
pshape('my_shape.DEC')
```

See also: *NMR Spectroscopy User Guide*

Related:

dshape	Display the last created pulse shape (M)
Pbox	Pulse shaping software (U)

pshapef — Plot the last created pulse shape (M)

Description: Plots real (X) and imaginary (Y) components of the last created shaped pulse.

See also: *NMR Spectroscopy User Guide*

Related:

dshape	Display the last created pulse shape (M)
Pbox	Pulse shaping software (U)

pshr — PostScript High Resolution plotting control (P)

Applicability: ALL

Syntax: `pshr=<value>`

Description: Global parameter that controls whether a 1D spectrum is plotted in hi-resolution mode or not. A hi-resolution plot is one in which every data point is represented in the plot. The standard resolution plot determines maximum and minimum values over small regions and plots those. The parameter pshr can have the values 1 for hi-res and 0 for standard plot.

Values:

`0` for standard resolution

`1` for high resolution.

Related:

pl	Plot spectra (C)
pslw	PostScript Line Width control (P)

pslabel — Pulse sequence label (P)

Description: Contains the text to be displayed in the `Seq:` field on the top line of the screen. This string may be different from the pulse sequence name selected with seqfil. However, the string in seqfil is the name of the pulse sequence

searched for when an experiment is started. Generally `seqfil=pslabel`, and when `seqfil` is set, the system sets `pslabel` to the same string.

See also: *NMR Spectroscopy User Guide*

Related: `seqfil` Pulse sequence name (P)

pslw PostScript Line Width control (P)

Applicability: ALL

Syntax: `pslw=<value>`

Description: Global parameter that adjusts the line width of PostScript plots.

Values: `0` (narrowest) to `100` (widest) line width.

Related: `pl` Plot spectra (C)
`pshr` PostScript High Resolution plotting control (P)

pssl Plot Arrayed Numbers (C)

Syntax: `pssl(<options>)`

Description: Plots a label for each element in a set of stacked spectra. The label is an integer value from 1 up to the number of spectra in the display.

Arguments: `options` can be any of the following:

- `'all'` is a keyword to display all of the spectra.
- `'int'` is a keyword to display only the integral, independently of the value of the parameter `intmod`
- `'top'` or `'side'` are keywords that cause the spectrum to be displayed either above or at the left edge, respectively, of a contour plot. This assumes that the parameters `sc`, `wc`, `sc2`, and `wc2` are those used to position the contour plot.
- `'dodc'` is a keyword for all spectra to be drift corrected independently.
- `'red'`, `'green'`, `'blue'`, `'cyan'`, `'magenta'`, `'yellow'`, `'black'`, and `'white'` are keywords that select a color.
- `'pen1'`, `'pen2'`, `'pen2'` … are keywords that pens.
- `'nopars'` — prevents the display commands from drawing the parameters at the bottom of the graphics screen.
- `'custom'` — uses the parameters `shownumx` (x position) and `shownumy` (y position), counting from bottom left of every spectrum.
- `'reverse'` — rotate the text by 90° - useful if the arrayed parameter values are long with respect to the width of the individual sub-spectra.
- `'value'` —The values of up to two simultaneous arrays are displayed. Diagonal arrays are allowed. The second parameter is shown in different color). The name of the arrayed parameter(s) is also shown. If used on a one-dimensional array representation of a 2D spectrum, `ni` and `phase` (in case of phase sensitive 2Ds) parameters are shown.
- `'list=xxx'` produces a display of the values contained in the arrayed parameter `xxx`.
- `'format=yyy'` uses the format `yyy` to control the plot of each label. See the `write` command for information about formats.

Examples:
```
pssl
pssl('top','left')
pssl('value','format=%3.1f')
```

See also: *NMR Spectroscopy User Guide*

Related:

dssl	Label a display of stacked spectra (M)
write	Write formatted text to a device (C)

ptext — Print out a text file (M)

Syntax: `ptext(file)`

Description: Prints out a text file.

Arguments: `file` is the name of the text file.

Examples:
```
ptext('/vnmr/maclib/ptext')
ptext(curexp+'/dept.out')
```

See also: *NMR Spectroscopy User Guide*

Related:

curexp	Current experiment directory (P)
dtext	Display a text file in the graphics window (C)
lookup	Look up words and lines from a text file (C)
pltext	Plot a text file (C)
text	Display text or set new text for current experiment (C)
textvi	Edit text file of current experiment (M)
vi	Edit text file with vi text editor (C)

ptspec3d — Region-selective 3D processing (P)

Description: Sets whether region-selective 3D processing occurs. If `ptspec3d` does not exist, it is created by the macro `par3d`. `ptspec3d` is functional at this time only for the f_3 dimension. If `ptspec3d='ynn'`, only the currently displayed region of f_3 is retained as non-zero values after the f_3 transform in the 3D FT. A larger f_3 region may be kept to ensure that the number of hypercomplex f_3 points is a power of 2; but that portion of the f_3 spectrum that is retained outside of the currently displayed region contains only zeroes. This 3D utility can reduce the fully transformed 3D data size by factors of 2 to 4, especially in some of the triple resonance experiments.

Values: A three-character string such as `'nnn'`, `'nny'`, `'nyn'`, etc. The default is `'nnn'`. The first character refers to the f_3 dimension (`sw`, `np`, `fn`); the second character, to the f_1 dimension (`sw1`, `ni`, `fn1`); and the third character, to the f_2 dimension (`sw2`, `ni2`, `fn2`). Each character may take one of two values: `'n'` for no region-selective processing in the relevant dimension, or `'y'` for region-selective processing in the relevant dimension.

See also: *NMR Spectroscopy User Guide*

Related:

fiddc3d	3D time-domain dc correction (P)
fn	Fourier number in directly detected dimension (P)
fn1	Fourier number in 1st indirectly detected dimension (P)
fn2	Fourier number in 2nd indirectly detected dimension (P)
ft3d	Perform a 3D Fourier transform (M)
ni	Number of increments in 1st indirectly detected dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
np	Number of data points (P)
ntype3d	N-type peak selection in f_1 or f_2 (P)
par3d	Create 3D acquisition, processing, display parameters (C)
specdc3d	3D spectral dc correction (P)

sw	Spectral width in directly detected dimension (P)
sw1	Spectral width in 1st indirectly detected dimension (P)
sw2	Spectral width in 2nd indirectly detected dimension (P)

ptsval — PTS frequency synthesizer value (P)

Description: Configuration parameter for the frequency of the PTS synthesizer on each channel. Every broadband system is equipped with a PTS frequency synthesizer as part of broadband frequency generation. The frequency of the unit is marked on its front panel. The value is set for each channel using the Synthesizer label in the Spectrometer Configuration window.

Values: 0 (Not Present choice in Spectrometer Configuration window); 160, 200, 250, 320, 500, 620, 1000 (PTS 160, PTS 200, PTS 250, PTS 320, PTS 500, PTS 620, PTS 1000 choices in Spectrometer Configuration window, respectively).

See also: *VnmrJ Installation and Administration*.

Related:

config	Display current configuration and possibly change it (M)
latch	Frequency synthesizer latching (P)
overrange	Frequency synthesizer overrange (P)

pulseinfo — Shaped pulse information for calibration (M)

Syntax:
```
pulseinfo<(shape,pulse_width<,reference_power>)>
   :width,power
```

Description: Returns or prints a table with the bandwidth and predicted pulse power settings for a given pulse shape. No parameter settings are changed. The necessary data is contained in the file shapeinfo in the system shapelib subdirectory.

Arguments: shape is the name of the pulse shape. The default is the system interactively prompts the operator for the name of the shape and the duration of the pulse and then prints a table containing the bandwidth of that pulse and the predicted pulse power settings.

pulse_width is the duration of the pulse, in µs.

reference_power is a value, in dB, for power calculations. The default is 55. This value replaces the assumption used for power calculation that pw90 is set for a tpwr of 55.

width returns the bandwidth of that pulse, in Hz.

power returns the predicted 90° pulse power settings.

Examples:
```
pulseinfo('gauss',1000):bw,pwr
```

See also: *User Programming*

Related:

bandinfo	Shaped pulse information for calibration (M)
pw90	90° pulse width (P)
tpwr	Observe transmitter power level with linear amplifiers (P)

pulsetool — RF pulse shape analysis (U)

Syntax:
```
pulsetool <-shape filepath>
```

Description: Enables examination of shaped rf pulses. It is started from a UNIX window.

Arguments: The optional -shape filepath specifies the name of an rf pulse template file that is displayed when pulsetool is started.

Examples:
```
pulsetool
pulsetool -shape /vnmr/shapelib/sinc.RF
```

See also: *NMR Spectroscopy User Guide*

purge — Remove macro from memory (C)

Syntax: `purge<(file)>`

Description: Removes one or more macros from memory, freeing extra memory space.

Arguments: `file` is the name of a macro file to be removed from memory. The default is to remove all macros that have been loaded into memory.

CAUTION: **The `purge` command with no arguments should never be called from a macro. The `purge` command with an argument should never be called by the macro being purged.**

Examples:
```
purge
purge('_sw')
```

See also: *User Programming*

Related: `macrold` Load a macro into memory (C)

puttxt — Put text file into a data file (C)

Syntax: `puttxt(file)`

Description: Copies text from current experiment into a data file.

Arguments: `file` is the name of a data file (i.e., a directory with a `.fid` or `.par` suffix). Do not include the suffix in the name provided to `file`.

Examples:
```
puttxt('mydata')
```

See also: *NMR Spectroscopy User Guide*

Related: `gettxt` Get text file from another file (C)

putwave — Write a wave into Pbox.inp file (M)

Syntax: `putwave(sh,bw,pw,ofs,st,ph,fla,trev,d1,d2,d0)`

Description: Sets up a single excitation band in the `Pbox.inp` file. An unlimited number of waves can be combined by reapplying `putwave`.

Arguments: 1 to 11 wave parameters in the following predefined order:

`sh` is the name of a shape file.

`bw` is the bandwidth, in Hz.

`pw` is the pulsewidth, in sec.

`ofs` is the offset, in Hz.

`st` is a number specifying the spin status: 0 for Mz, or 1 for Mxy.

`ph` is the phase (or phase cycle, see `wavelib/supercycles`).

`fla` is the flip angle. Note that `fla` can override the default flip angle.

`trev` concerns time reversal. It can be used to cancel time reversal if spin status (`st`) is set to 1 for Mxy.

`d1` is the delay, in sec, prior the pulse.

`d2` is the delay, in sec, after the pulse.

`d0` is a delay or command prior to `d1`. If `d0=a`, the wave is appended to the previous wave.

Examples:
```
putwave('eburp1')
putwave('GARP',12000.0)
putwave('esnob',600,-1248.2,1,90.0,'n','n',0.001)
```

See also: *NMR Spectroscopy User Guide*

Related:

Pbox	Pulse shaping software (U)
setwave	Write a wave definition string into the Pbox.inp file (M)

pw — Enter pulse width pw in degrees (C)

Syntax: `pw(flip_angle,<90_pulse_width>)`

Description: Calculates the flip tim, in µs, given a desired flip angle and 90° pulse. The value is entered into the parameter pw.

Arguments: `flip_angle` is the desired flip angle, in degrees.

`90_pulse_width` is the 90° pulse length, in µs. The default is the value of parameter pw90, if it exists.

Examples:
```
pw(30)
pw(90,12.8)
```

See also: *NMR Spectroscopy User Guide*

Related:

ernst	Calculate the Ernst angle pulse (C)
pw	Pulse width (P)
pw90	90° pulse width (P)

pw — Pulse width (P)

Description: Length of the final pulse in the standard two-pulse sequence. In “normal” 1D experiments with a single pulse per transient, this length is the observe pulse width.

Values: 0, 0.1 µs to 8190 sec, smallest value possible is 0.1 µs, finest increment possible is 12.5 ns.

See also: *NMR Spectroscopy User Guide*

Related:

p1	First pulse width (P)
pw	Enter pulse width parameter pw in degrees (C)

pw90 — 90° pulse width (P)

Description: Length of the 90° pulse. pw90 is not used by pulse sequences directly, but is used by a number of commands to assist in setting up special experiments. pw90 is also used by certain output programs to be able to print the value of the pulse width in degrees instead of microseconds. Note that this parameter must be updated by the user and is not automatically determined or magically correct under all circumstances.

Values: 0, 0.1 µs to 8190 sec, smallest value possible is 0.1 µs, finest increment possible is 12.5 ns.

See also: *NMR Spectroscopy User Guide*

Related:

AC1S-AC11S	Autocalibration macros (M)
pw	Enter pulse width parameter pw in degrees (C)

pwd — Display current working directory (C)

Syntax: `pwd<:directory>`

Description: Displays the path of the current working directory.

Arguments: `directory` is a string variable with the path of the current directory.

Examples:
```
pwd:$name
```

See also: *NMR Spectroscopy User Guide*

Related:

cd	Change working directory (C)
dir	List files in current directory (C)
lf	List files in current directory (C)
ls	List files in current directory (C)

pwpat — Shape of refocusing pulse (P)

Applicability: Systems with imaging capabilities.

Description: Specifies the shape of the refocusing pulse pw in imaging experiments

Values: 'hard', 'sinc', 'gauss', 'sech', 'sine', or any shape resident in the system pulse shape library or libraries.

See also: *VnmrJ Imaging NMR*

Related:

p1pat	Shape of an excitation pulse (P)
pw	Pulse width (P)

pwr — Set power mode in directly detected dimension (C)

Description: Selects the power spectra display mode by setting dmg='pwr'. In the *power mode*, each real point in the displayed spectrum is calculated as the sum of the squares of the real and imaginary points comprising each respective complex data point. All information, including noise, is positive and the relationship between signal and noise is non-linear.

For multidimensional data, pwr has no effect on data prior to the second Fourier transform. If pmode='full', pwr acts in concert with the commands ph1, av1 or pwr1 to yield the resultant contour display for the 2D data.

See also: *NMR Spectroscopy User Guide*

Related:

av	Set abs. value mode in directly detected dimension (C)
av1	Set abs. value mode in 1st indirectly detected dimension (C)
dmg	Data display mode in directly detected dimension (P)
ft	Fourier transform 1D data (C)
ft1d	Fourier transform along f_2 dimension (C)
ft2d	Fourier transform 2D data (C)
pa	Set phase angle mode in directly detected dimension (C)
pa1	Set phase angle mode in 1st indirectly detected dimension (C)
ph	Set phased mode in directly detected dimension (C)
ph1	Set phased mode in 1st indirectly detected dimension (C)
pmode	Processing mode for 2D data (P)
pwr1	Set power mode in 1st indirectly detected dimension (C)
pwr2	Set power mode in 2nd indirectly detected dimension (C)
wft	Weight and Fourier transform 1D data (C)
wft1d	Weight and Fourier transform f_2 of 2D data (M)
wft2d	Weight and Fourier transform 2D data (M)

pwr1 — Set power mode in 1st indirectly detected dimension (C)

Description: Selects the power spectra display mode along the first indirectly detected dimension by setting dmg1='pwr1'. If the parameter dmg1 does not exist, pwr1 creates it and sets it to 'pwr1'. In the *power mode*, each real point in the displayed trace is calculated as the sum of the squares of the real and imaginary points comprising each respective complex data point. For hypercomplex data, the real-real and imaginary-real points from each respective hypercomplex data

point are used in the summation. In this mode, all information, including noise, is positive and the relationship between signal and noise is non-linear.

The pwr1 command is only needed if mixed-mode display is desired. If the parameter dmg1 does not exist or is set to the null string, the display mode along the first indirectly detected dimension defaults to the display mode of the directly detected dimension (characterized by the parameter dmg). For the contour display of multidimensional data, the result of pwr1 is the same as for traces, provided that pmode='partial' or pmode=''.

See also: *NMR Spectroscopy User Guide*

Related:

dmg1	Data display mode in 1st indirectly detected dimension (P)
pa	Set phase angle mode in directly detected dimension (C)
pa1	Set phase angle mode in 1st indirectly detected dimension (C)
pmode	Processing mode for 2D data (P)
pwr	Set power mode in directly detected dimension (C)
pwr2	Set power mode in 2nd indirectly detected dimension (C)

pwr2 — Set power mode in 2nd indirectly detected dimension (C)

Description: Selects the power spectra display mode along the second indirectly detected dimension by setting dmg2='pwr2'. If dmg2 does not exist or is set to the null string, pwr2 will create dmg2 and set it equal to 'pwr2'. In the *power mode*, all information, including noise, is positive and the relationship between signal and noise is non-linear. Each real point in the displayed trace is calculated as the sum of the squares of the real and imaginary points comprising each respective complex data point. For hypercomplex data, the real-real and imaginary-real points from each respective hypercomplex data point are used in the summation.

The pwr2 command is only needed if mixed-mode display is desired. If the parameter dmg2 does not exist or is set to the null string, the display mode along the second indirectly detected dimension defaults to the display mode of the directly detected dimension (characterized by the parameter dmg). For the contour display of multidimensional data, the result of pwr2 is the same as for traces, provided that pmode='partial' or pmode=''.

See also: *NMR Spectroscopy User Guide*

Related:

av2	Set abs. value mode in 2nd indirectly detected dimension (C)
dmg2	Data display mode in 2nd indirectly detected dimension (P)
ft1d	Fourier transform along f_2 dimension (C)
ft2d	Fourier transform 2D data (C)
ph2	Set phased mode in 2nd indirectly detected dimension (C)
pmode	Processing mode for 2D data (P)
pwr	Set power mode in directly detected dimension (C)

pwsadj — Adjust pulse interval time (M)

Applicability: Systems with waveform generators.

Syntax: pwsadj(shape_file,pulse_parameter)

Description: Adjusts the pulse interval time so that the pulse interval for the specified shape is an integral multiple of 100 ns. This ensures there is no time truncation error in executing the shaped pulse by waveform generators.

Arguments: shape_file is a file name of a shaped pulse file. The name can be specified with or without the .RF file extension. pwsadj first looks for the file name specified by shape_file in the user's shapelib directory. If the file

specified is not found there, `pwsadj` then looks in the system `shapelib` directory.

`pulse_parameter` is a string containing the adjusted pulse interval time.

Examples: `pwsadj('pulse12','pulseparam')`

See also: *User Programming*

Related:
- `dmfadj` Adjust decoupler tip-angle resolution time (M)
- `dmf2adj` Adjust second decoupler tip-angle resolution time (M)

pwxcal — Decoupler pulse calibration (M)

Description: Provides an interactive method of selecting the decoupler (first, second, or third) and the nucleus (^{13}C, ^{15}N, or ^{31}P) to calibrate. The `pwxcal` pulse sequence determines the pulse width characteristics of the probe's decoupler channel(s) in indirect detection or triple resonance experiments. `pwxcal` can also be used to determine the rf field homogeneity of the decoupler.

The parameter `pwx1` is arrayed to calibrate the 90° pulse width on the first decoupler. If a second decoupler is present, the parameter `pwx2` is arrayed to calibrate the 90° pulse width on that decoupler. If a third decoupler is present, the parameter `pwx3` is arrayed to calibrate the 90° pulse width on that decoupler. Other parameters include: `jC13` is the ^{13}C-^{1}H coupling, constant, `jN15` is the ^{15}N-^{1}H coupling constant, `jP31` is the ^{31}P-^{1}H coupling constant, and `jname` is a selected calibration nucleus.

See also: *System Administration*

pxbss — Bloch-Siegert shift correction during Pbox pulse generation (P)

Description: A flag to enable or disable Bloch-Siegert shift correction during the creation of Pbox pulses.

Values: 'y' enable Bloch-Siegert shift correction
'n' disable Bloch-Siegert shift correction
Default value is 'y'.

See also: *NMR Spectroscopy User Guide*

Related:
- `htfrq1` Hadamard frequency list in `ni` (P)

pxrep — Flag to set the level of Pbox reports (P)

Description: A flag to set the level of Pbox debug messages displayed at the start of acquisition.

Values: 'y' shows all Pbox reports.
'h' shows the Hadamard matrix.
'n' shows no reports.
Default value is 'nnn'.

See also: *NMR Spectroscopy User Guide*

Related:
- `htfrq1` Hadamard frequency list in `ni` (P)

pxset — Assign Pbox calibration data to experimental parameters (M)

Syntax: `pxset<(file.ext)>`

Description: Retrieves experimental settings from a file and assigns them to corresponding experimental parameters using a dialog form. If no file name is provided, `pxset` extracts data from the `Pbox.cal` file that contains the output data of the last created waveform

Arguments: `file.ext` is the name of a shape or pattern file.

Examples:
```
pxset
pxset('Pbox.RF')
```

See also: *NMR Spectroscopy User Guide*

Related:
- `Pbox` — Pulse shaping software (U)
- `pboxget` — Extract Pbox calibration data (M)

pxshape — Generates a single-band shape file (M)

Syntax:
```
pxshape('sh bw/pw ofs st ph fla trev   \
   d1 d2 d0',name,disp)
```

Description: Generates a single-band waveform based on wave definition provided as a single string of wave parameters.

Arguments: A single string of 1 to 12 wave parameters in predefined order. Note that a single quote is required at the start and the end of the entire string, but no single quotes are required surrounding characters and strings inside the entire string.

`sh` is the name of a shape file.

`bw/pw` is either the bandwidth, in Hz, or the pulsewidth, in sec.

`ofs` is the offset, in Hz.

`st` is a number specifying the spin status: 0 for Mz, or 1 for Mxy.

`ph` is the phase (or phase cycle, see `wavelib/supercycles`).

`fla` is the flip angle. Note that `fla` can override the default flip angle.

`trev` is a time reversal. This can be used to cancel time reversal if spin status (`st`) is set to 1 for Mxy.

`d1` is the delay, in sec, prior the pulse.

`d2` is the delay, in sec, after the pulse.

`d0` is a delay or command prior to `d1`. If `d0=a`, the wave is appended to the previous wave.

`name` is the output file name. An extension is optional and can be used to override an internally defined shape type.

`disp` is the shape is displayed by default in the graphics window. If `disp` is set to `'n'`, the shape is not displayed.

Examples:
```
pxshape('eburp1','myshape.RF')
pxshape('GARP 12000.0','shape2','y')
pxshape('esnob 600.0 -1248.2 n 180.0 n n 0.001','xxx')
```

See also: *NMR Spectroscopy User Guide*

Related:
- `Pbox` — Pulse shaping software (U)

Pxsim — Simulate Bloch profile for a shaped pulse (U)

Syntax:
```
Pxsim file <simtime <num_steps <add/sub>>>
```

Description: Used by the `dprofile` macro to simulate a Bloch profile for a shaped pulse. `Pxsim` extracts the information necessary for simulation from the shape header. Only shape files containing this information can be processed.

Arguments: `file` is the name of a shape or pattern file including an .RF or .DEC extension. `Pxsim` searches for the file in the user's `shapelib` (`~/vnmrsys/shapelib`), and if not found there, it searches in the system `shapelib` (`vnmr/shapelib`).

`simtime` is the maximum simulation time (in sec) that can be provided.

`num_steps` is the number of steps in the profile.

`add/sub` is add (a) or subtract (s) from the previous simulation.

Examples: `Pxsim myshape.RF`

See also: *NMR Spectroscopy User Guide*

Related: `Pbox` Pulse shaping software (U)

`Pxspy` Create shape definition using Fourier coefficients (U)

Syntax: `Pxspy file`

Description: An interactive program that converts shaped pulse files into a Fourier series and produces an output file `pbox.cf` in the user's `shapelib` (`~/vnmrsys/shapelib`), which can be used to create a wave definition file in the `wavelib` directory. `Pxspy` can also be used to convert hard pulse decoupling sequences into soft (“cool”) decoupling waveforms. The resulting Fourier coefficients can depend on the number of points in the waveform.

Arguments: `file` is the name of a shape or pattern file, including an .RF, .DEC, or .GRD extension. The name can be given as a relative name, absolute name, or as a simple name (i.e., with a path). If given as a simple name, Pxspy searches for the file in the user’s `shapelib` (`~/vnmrsys/shapelib`), and then if not found there, it searches in the system `shapelib` (`vnmr/shapelib`).

Examples:
```
Pxspy myshape.RF
Pxspy /vnmr/shapelib/myshape.RF
Pxspy ~vnmrsys/shapelib/myshape.RF
```

See also: *NMR Spectroscopy User Guide*

Related: `Pbox` Pulse shaping software (U)

P

Q

qcomp	Longer dead time for longer ring down (P)
QKexp	Set up quick experiment (M)
qtune	Tune probe using swept-tune graphical tool (C)
?	Display the value of an individual parameter)

qcomp — Longer dead time for longer ring down (P)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Global parameter to handle longer ring down times following the rf pulse. This is only active if `dsp='i'` or if `dsp='r'` and `fsq='y'`. The dead time is calculated by the software and the DSP parameters are appropriately adjusted for flat baseline and good phase properties. If it is necessary to use a user specified delay, create the `prealfa` parameter. `qcomp` is not effective in explicit acquisition experiments. Not compatible with `srof2` .

Values: `qcomp='y'` triggers a longer dead time before the receiver is gated on for the acquisition.

Related:

prealfa	Specify a delay for longer ring down (P)
dsp	Type of DSP for data acquisition (P)

QKexp — Set up quick experiment (M)

Syntax: `QKexp(arguments)`

Description: Set up parameters for quick experiment for a chained acquisition. Multiple arguments can be given to define the chain. Default parameter values are used by the macro and or the probe file is used.

Examples:

```
QKexp('PROTON','COSY','HMQC')
QKexp('PROTON','CARBON','HETCOR','gCOSY')
```

qtune — Tune probe using swept-tune graphical tool (C)

Syntax: `qtune<(gain<,power>)>`

Description: Displays a real-time graph showing reflected power versus frequency for tuning probes. If the acquisition system has been recently rebooted, enter `su` before running `qtune`. Refer to the manual *NMR Spectroscopy User Guide* for a detailed description of this tool.

Arguments: `gain` specifies the gain value, typically 20 to 50. The default is 50.
`power` specifies the power value, typically 60 to 70. The default is 60.

Examples:

```
qtune
qtune(20)
qtune(38,65)
```

See also: *NMR Spectroscopy User Guide*

Related:

tugain	Amount of receiver gain used by qtune (P)
su	Submit a setup experiment to acquisition (M)
tune	Assign frequencies (C)

Q

? Display the value of an individual parameter (C)

Syntax: `parameter_name<[index]>?`

Description: The question mark displays the current numerical or string value of a parameter when the parameter name is followed by a question mark. No change is made to the value of the parameter. To display an individual element of an parameter array, provide the index in square brackets (e.g., `nt[3]?` might display "`nt[3]=2`")

Certain parameters can be "turned off" by setting the parameter to `'n'`. The display of a parameter that is turned off will be the phrase "Not Used" followed by the actual value in parentheses. For example, if `lb` is set to 1.5 and then set to `'n'`, entering `lb?` will display `lb= Not Used (1.5)`. Such a parameter can be "turned on" by setting it to `'y'`. It will then have its prior value.

To show a parameter's array of values or learn about its attributes, use the `display` command.

Arguments: `index` is the integer for a selected member of an arrayed parameter.

Examples:
```
lb?
sw?
pw[2]?
```

See also: *NMR Spectroscopy User Guide*

Related:

`display`	Display parameters and their attributes (C)
`getvalue`	Get value of a parameter in a tree (C)

R

r	Recall display parameter set (M)
r(n)	Recall some display parameters (C)
r1-r7	Real-value storage for macros (P)
ra	Resume acquisition stopped with sa command (C)
rcvrwt	Weighting for different receivers (P)
react	Recover from error conditions during werr processing (M)
readallshims	Read all shims from hardware (M)
readbrutape	Read Bruker data files from 9-track tape (U)
readfile	Read the contents of a text file into two parameters (C)
readhw	Read current values of acquisition hardware (C)
readlk	Read current lock level (C)
readparam	Read one of more parameters from a file (C)
readultra	Read shim coil setting for Ultra•nmr shim system (M)
real	Create a real variable without a value (C)
recon_all	Reconstruct images from 2D MRI fid data (C)
record	Record keyboard entries as a macro (M)
redor1	Set up parameters for REDOR1 pulse sequence (M)
redosy	Restore 2D DOSY display from sub experiment (M)
reff1	Reference f2 Indirect Dimension from Observe Dimension (M)
reff2	Reference f2 Indirect Dimension from Observe Dimension (M)
reffrq	Reference frequency of reference line (P)
reffrq1	Reference freq. of reference line in 1st indirect dimension (P)
reffrq2	Reference freq. of reference line in 2nd indirect dimension (P)
refpos	Position of reference frequency (P)
refpos1	Position of reference frequency in 1st indirect dimension (P)
refpos2	Position of reference frequency in 2nd indirect dimension (P)
refsource1	Center frequency in 1st indirect dimension (P)
refsource2	Center frequency in 2nd indirect dimension (P)
region	Divide spectrum into regions (C)
relayh	Set up parameters for RELAYH pulse sequence (M)
rename	Move and/or rename a file (C)
reqparcheck	Flag which enables/disables required parameters (P)
reqparclear	Clears the parameters in required parameter list (M)
reqparlist	List of required parameters (P)
reqpartest	Tests whether required parameters are set (M)
resetf3	Reset parameters after a partial 3D Fourier transform (M)
resetplotter	Reset plotter to system plotter (M)
resolv	Set resolution enhancement parameters (M)
restorenuctable	Calculate and (Re-)store accurate nuctable (M)
resume	Resume paused acquisition queue (C)
return	Terminate execution of a macro (C)
rev	System software revision level (P)
revdate	System software preparation date (P)

R

rfband	RF band in use (P)
rfblk	Reverse FID block (C)
rfchannel	Independent control of rf channel selection (P)
rfchtype	Type of rf channel (P)
rfdata	Reverse FID data (C)
rfl	Reference peak position in directly detected dimension (P)
rfl1	Reference peak position in 1st indirectly detected dimension (P)
rfl2	Reference peak position in 2nd indirectly detected dimension (P)
rfp	Reference peak frequency in directly detected dimension (P)
rfp1	Reference peak freq. in 1st indirectly detected dimension (P)
rfp2	Reference peak freq. in 2nd indirectly detected dimension (P)
rftrace	Reverse FID trace (C)
rftype	Type of rf generation (P)
rfwg	RF waveform generator (P)
right	Set display limits to right half of screen (C)
rights	Determine an operator's specified right (C)
rinput	Input data for a regression analysis (M)
rl	Set reference line in directly detected dimension (M)
rl1	Set reference line in 1st indirectly detected dimension (M)
rl2	Set reference line in 2nd indirectly detected dimension (M)
rm	Delete file (C)
rmdir	Remove directory (C)
rmsAddData	Add transformed data files with weighting (U)
Roesy	Convert the parameter to a ROESY experiment (M)
Roesy1d	Convert the parameter set to a Roesy1d experiment (M)
rof1	Receiver gating time preceding pulse (P)
rof2	Receiver gating time following pulse (P)
rof3	Receiver gating time following T/R switch (P)
rotate	Rotate 2D data (C)
rotorsync	Rotor synchronization (P)
rp	Zero-order phase in directly detected dimension (P)
rp1	Zero-order phase in 1st indirectly detected dimension (P)
rp2	Zero-order phase in 2nd indirectly detected dimension (P)
rt	Retrieve FIDs (M)
rtcmx	Return Spinsight data into current experiment (C)
rtp	Retrieve parameters (M)
rts	Retrieve shim coil settings (C)
rttmp	Retrieve experiment data from experiment subfile (M)
rtv	Retrieve individual parameters (C)
rtx	Retrieve parameters based on rtx rules (C)

r — Recall display parameter set (M)

Syntax: (1) `rset_number`
(2) `r(set_number)`

Description: Recalls the parameters sp, wp, sp1, wp1, sp2, wp2, sc, wc, sc2, wc2, ho, vo, vs, and ai/nm of a selected display parameter set. Not recalled are phase

parameters, drift correction parameters, integral reset parameters, and reference parameters. This allows, for example, saving a set of display parameters, adjusting the phase or drift correction, and later recalling the display parameters without und0oing the new phase or drift correction.

Arguments: `set_number` is the number, from 1 to 9, of a display parameter set.

Examples:
```
r2
r(3)
```

See also: *NMR Spectroscopy User Guide*

Related:

`ai`	Select absolute intensity mode (C)
`fr`	Full recall of a display parameter set (M)
`ho`	Horizontal offset (P)
`nm`	Select normalized intensity mode (C)
`s`	Save display parameters as a set (M)
`sc`	Start of chart (P)
`sc2`	Start of chart in second direction (P)
`sp`	Start of plot in directly detected dimension (P)
`sp1`	Start of plot in 1st indirectly detected dimension (P)
`sp2`	Start of plot in 2nd indirectly detected dimension (P)
`vo`	Vertical offset (P)
`vs`	Vertical scale (P)
`wc`	Width of chart (P)
`wc2`	Width of chart in second direction (P)
`wp`	Width of plot in directly detected dimension (P)
`wp1`	Width of plot in 1st indirectly detected dimension (P)
`wp2`	Width of plot in 2nd indirectly detected dimension (P)

r(n) — Recall some display parameters (C)

Applicability: All

Syntax: `r(n<,noupdate>)`

Description: `r(n)` recalls only the following parameters: `sp`, `wp`, `sp1`, `wp1`, `sp2`, `wp2`, `sc`, `wc`, `sc2`, `wc2`, `ho`, `vo`, `vs`, and `ai`/`nm`.

`noupdate` — as a second argument prevents the automatic update of interactive programs.

Arguments: `n=1 to 9`

See also: *User Programming*

Related:

`fr(n)`	Recall all the parameters of the specified display parameter set (C)
`s(n)`	Save a copy of the current values of all display parameters (C)

r1-r7 — Real-value storage for macros (P)

Description: The seven parameters `r1`, `r2`, `r3`, `r4`, `r5`, `r6`, and `r7` are available in each experiment for macros to store a real value.

See also: *User Programming*

Related:

`dgs`	Display group of special/automation parameters (M)
`n1,n2,n3`	Name storage for macros (P)

ra — Resume acquisition stopped with sa command (C)

Description: Resumes an experiment acquisition that was stopped with the `sa` command. `ra` is not permitted after any parameters have been brought into the stopped

experiment with the rt or rtp macros. The parameters dp and np may not be altered.

ra applies to the experiment that you are joined to at the time the command is entered. If experiment 1 has been previously stopped with sa, you must be joined to experiment 1 for ra to resume that acquisition. If you are in experiment 2, entering ra has no effect on experiment 1.

If an experiment has been stopped with sa, you can increase the number of transients nt and resume the acquisition with ra. You cannot, however, increase nt and enter ra if the experiment had completed in a normal fashion (i.e., it was not stopped with sa).

Note that the completion time and remaining time shown in the Acquisition Status window are not accurate after ra is executed.

See also: *NMR Spectroscopy User Guide*

Related:

dp	Double precision (P)
np	Number of data points (P)
nt	Number of transients (P)
rt	Retrieve FID (M)
rtp	Retrieve parameters (M)
sa	Stop acquisition (C)

rcvrwt — Weighting for different receivers (P)

Applicability: Systems with multiple receivers.

Description: An array of real numbers giving weighting factors to use when combining multiple receiver data. The i'th array element is used to weight data from the i'th receiver. Applying a weight factor is like increasing the gain of the receiver by the same factor (but the weights are specified as numerical factors rather than in dB).

Examples:

```
rcvrwt=10,12,8
```

react — Recover from error conditions during werr processing (M)

Syntax:

```
react<('wait')>
```

Description: When an acquisition error occurs, any action specified by the werr parameter is executed. The react macro is a prototype for handling these errors. This macro can be invoked for error handling by setting werr='react'. The acqstatus parameter is provided so that react can determine which specific error has occurred.

Arguments: 'wait' is a keyword for a special type of error handling during an automation run. The react macro always uses the 'next' option when it calls the command au. Under certain conditions, it is also appropriate to use the 'wait' option. react checks to see if an argument was passed to it; that is, werr='werr(\'wait\')' to determine whether to use the 'wait' option of au.

See also: *NMR Spectroscopy User Guide*

Related:

acqstatus	Acquisition status (P)
au	Submit experiment to acquisition and process data (C)
werr	Specify action when error occurs (C)
werr	When error (P)

readallshims — Read all shims from hardware (M)

Description: Reads all shims from the hardware and sets the values into the shim parameters in the current parameter tree. The shims used depend on the shimset configuration. For the shim set on the Ultra•nmr shim system, readallshims is active only if hardware-to-software shim communication is enabled.

See also: *NMR Spectroscopy User Guide*

Related:

load	Load status of displayed shims (P)
readhw	Read current values of acquisition hardware (C)
setallshims	Set all shims into hardware (M)
sethw	Set values for hardware in acquisition system (C)
shimset	Type of shim set (P)
su	Submit a setup experiment to acquisition (M)

readbrutape — Read Bruker data files from 9-track tape (U)

Syntax: (From UNIX) readbrutape file <number_skipped>

Description: A shell script that reads one file from a Bruker tape into a UNIX file with the name specified. Bruker tapes are likely to be made at 1600 bpi, although 1600 bpi is not a requirement.

Arguments: file is the name of the file read into UNIX. For identification, the .bru extension is added to the file name.

number_skipped is the number of files skipped and *includes* the header file (which is assumed to be the first file on the tape). The default is the script reads the first file after the header file. If number_skipped equals 0, there is no rewinding and the first file (or the next file) on the tape is read.

See also: *NMR Spectroscopy User Guide*

Related:

convertbru	Convert Bruker data (M,U)

readfile — Read the contents of a text file into two parameters (C)

Examples: readfile (path, par1, par2, <,cmpstr <,tree> >):num

Description: readfile reads the contents of a file and puts the contents into two supplied parameters. The first word on each line in the file is placed in the first parameter. The remainder of the line is placed in the second parameter. An optional fourth argument specifies a string which is used to match the first word of the line. For example, if the file contained:

```
H1pw 10
H1pwr 55
C13pw 14
C13pwr 50
```

and the comparison string was set to H1, only the lines starting with H1 would be put into the parameters. Namely, H1pw and H1pwr.

Arguments: path is the path name of the file to read.

par1 is the name of the parameter to hold the first word of the line.

par2 is the name of the parameter to hold the remainder of each line.

cmpstr is the optional comparison string for matching the first word.

tree is an optional parameter to select the tree for par1 and par2. The possibilities are current, global, and local. Current is the default. Local is used if the parameters are $macro parameters. If tree is used, the cmpstr must also be supplied. If cmpstr is '', then it is ignored.

The par1 and par2 parameters must already exist. If par1 or par2 are defined as a real parameter, as opposed to a string parameter, then if the value does not have a number as the first word, a zero will be assigned.

num will be set to the number of items in the arrayed parameters par1 and par2.

Lines that only contain white space are not added to the parameters. Lines that start with a # are not added to the parameters. Lines which start with a # can be used as comment lines. If a line only contains a single word, that word is put into the first parameter. The corresponding array element of the second parameter will be set to an empty string. The readfile will return the number of lines added to the parameters.

Examples: Examples using a prototype file containing the following:

```
# A readfile test case
# Proton values
H1pw 10
H1pwr 55
# Carbon values
C13pw 14
C13pwr 50
H1macro ft f full aph vsadj
End
```

```
readfile(systemdir+'/probes/testcase','attr','vals')
```

This sets the attr and vals parameters to arrays of six strings.

```
attr='H1pw','H1pwr','C13pw','C13pwr','H1macro','End'
vals='10','55','14','50','ft f full aph vsadj',''
```

```
readfile(systemdir+'/probes/
testcase','attr','vals','H1')
```

This sets the attr and vals parameters to arrays of three strings.

```
attr='H1pw','H1pwr','H1macro'
vals='10','55','ft f full aph vsadj'
```

The readfile command might be used in conjunction with the teststr command. The teststr command can be used to search an arrayed parameter to determine the index of a specified element.

For example,

```
teststr(attr,'H1pwr'):$e
vals[$e] will be the value of 'H1Pwr'
```

readhw — Read current values of acquisition hardware (C)

Syntax:

```
readhw("param1","param2",...)<:r1,r2,...>
```

```
readhw("keword"):$res1,...
```

Description: Returns or displays the current values of the lock system parameters lockpower, lockgain, lockphase, lock, temp, loc, and z0.

The values of the shims can also be obtained. The particular shims that can be read depends upon the type of shim hardware present in the system. See the description of shimset for a list of the shim names for each type of shim hardware.

Shim DACs read by readhw:

- Axial shim: z1, z2, z3, z4, z1c, z2c
- Non-axial shims: x1, y1, xz, yz, xy, x2y2, x3, y3
- Special Oxford magnets shims: z5, xz2, yz2, zx2y2, zxy

Arguments: param1,param2,... parameter to read — maximum of 10 parameters.

`r1,r2,...` Vnmr variables hold the returned results

no variables supplied — results are displayed in the text panel

Keywords:

`loc` —sample changer location.

`temp` — returns the sample temperature, controller status, and set point. Results are displayed in the text panel if no variables are supplied

Returned value	*Status*
0	Regulation off
1	Regulated
2	Not regulated
3	No controller

`status` — returns the systems status as an integer. The returned values are:

Returned value	*Status*
10	IDLE
15	PARSE
16	PREP
17	SYNCED
20	ACQUIRE
25	PAD
30	VTWAIT
40	SPINWAIT
50	AGAIN
60	ALOCK
61	AFINDRES
62	APOWER
63	APHASE
70	SHIMMING
80	SMPCHANGE
81	RETRIEVSMP
82	LOADSMP
90	INTERACTIVE
100	TUNING
0	INACTIVE
Error messages	
-1	Available on spectrometer only (i.e. system = 'datastation')
-2	acquisition not active (acquisition communication programs are not running try running `su acqproc`).
-7	console powered down or not connected

Results are displayed in the text panel if no variables are supplied.

`readhw` cannot be used when an acquisition is in progress or when `acqi` is connected to the acquisition system.

Arguments: `param1, param2,...` are the names of the parameters to be read. `value1,value2,...` are return variables to store the settings of the parameters specified. The default is to display the setting in the status window.

Examples:
```
readhw('z1c','z2c','z1','z2')
readhw('z1c','z2c','z1','z2'):r1,r2,r3,r4
readhw('temp'):$t sets $t
```

See also: *NMR Spectroscopy User Guide*

Related:

lockgain	Lock gain (P)
lockphase	Lock phase (P)
lockpower	Lock power (P)
readallshims	Read all shims from hardware (M)
sethw	Set values for hardware in the acquisition system (C)
shimset	Type of shim set (P)

readlk — Read current lock level (C)

Syntax: `readlk<:lock_level>`

Description: Returns the same information as would be displayed on the digital lock display using the manual shimming window. `readlk` can be used in developing automatic shimming methods such as shimming via grid searching. It *cannot* be used during acquisition or manual shimming.

Arguments: `lock_level` returns the current lock level.

Examples:
```
readlk
readlk:$levell
```

See also: *User Programming*

Related: alock — Automatic lock status (P)

readparam — Read one of more parameters from a file (C)

Syntax: `readparam(file,parlist[,tree[,type]])-`

Description: The `readparam` command will read one or more parameters from a specified file. The first argument is the name of the file. The second argument is a list of the names of the parameters to be read. It is a string parameter and the names can be separated either by a space or a comma. If a parameter in the list is not present in the file being read, no error is generated. The optional third argument is the tree into which the parameters are read. The variable trees are 'current', `'global'`, `'processed'` and `'systemglobal'`. The optional fourth argument controls the behavior of the `readparam` command. The options are `'read'`, `'replace'`, and `'add'`. The default type is `'read'`.

Examples: In order to specify the type, the tree must also be specified. The behaviors are best illustrated with specific examples. Lets say that there is a temporary file containing only the parameters a and b. We are going to use the readparam command to read parameters into a current tree which contains the parameters a and c but does not contain the parameters b and d. This can be summarized as:

Parameters in mypar: a=1 b=2

Initial parameters in current tree: a=4 c=8 (b and d do not exist)

```
readparam(curexp+'/mypar','a b c d','current','read')
```

Parameter in a current tree is replaced with parameter from `mypar`. Parameter b in current tree is read in from mypar Parameter c in current tree is unaltered Parameter d in current tree still does not exist. Final parameters in current tree: a=1 b=2 c=8 (d does not exist).

```
readparam(curexp+'/mypar','a b c d','current','replace')
```

Parameter in a current tree is replaced with parameter from `mypar`. Parameter b in current tree still does not exist. Parameter c in current tree is deleted.

Parameter d in current tree still does not exist. Final parameters in current tree: a=1 (b c and d do not exist).

```
readparam(curexp+'/mypar','a b c d','current','add')
```

Parameter in a current tree is unaltered. Parameter b in current tree is read in from `mypar` Parameter c in current tree is unaltered. Parameter d in current tree still does not exist. Final parameters in current tree: a=4 b=2 c=8 (d does not exist).

This command may be used to read temporary values which have been saved with the `writeparam` command.

More Examples:

```
readparam(curexp+'/mypar','in')
```

reads the parameter in from the file mypar in the current experiment directory.

```
readparam(curexp+'/mypar','sw ct np','processed')
```

reads the parameters sw, ct, and np into the processed tree from the file mypar in the current experiment directory.

readultra — Read shim coil setting for Ultra•nmr shim system (M)

Applicability: Systems with the Ultra•nmr shim system.

Syntax: `readultra<(file_number)>`

Description: Reads shim set files for a Ultra•nmr shim system from a Sun floppy disk into VnmrJ. The floppy disk for Ultra•nmr contains up to 63 shim sets named `file1.dac` to `file63.dac`.

Arguments: `file_number` is the number of the shim set file, from 1 to 63. The default is to read all of the shim set files.

Examples:

```
readultra
readultra(6)
```

See also: *NMR Spectroscopy User Guide*

Related:

`shimset`	Type of shim set (P)
`svs`	Save shim coil settings (C)

real — Create a real variable without a value (C)

Syntax: `real(variable)`

Description: Creates a real variable without a value.

Arguments: `variable` is the name of the variable to be created.

Examples:

```
real('realval1')
```

See also: *User Programming*

Related:

`create`	Create a new parameter in a parameter tree (C)
`string`	Create a string variable (C)

recon_all — Reconstruct images from 2D MRI fid data (C)

Applicability: Imaging Systems

Syntax:

```
recon_all(acqstring,<pc option>)
```
or
```
recon_all(acqstring,<image directory>,<pc option>)
```
or
```
recon_all
```

Description: Produces 2D images (in fdf format) from FID data acquired with most 2D imaging sequence, including sems, gems, fsems, and epi.

Arguments: acqstring: Set to 'acq' to indicate concurrent reconstruction; performs no initialization. Any other value can be used for retrospective reconstruction or the first pass through concurrent reconstruction (initialization is performed).
pc option: Optional argument to specify phase correction method (see description of phase correction below).
image directory: Optional argument to specify the directory which will contain produced fdf files.
NB: for control of some features (see below), recon_all accesses parameters in the PROCESSED tree. It is in the PROCESSED tree that variables should be created and/or modified for effectiveness with recon_all.
Input/Output: recon_all reads the FID file in the acqfil subdirectory of the current experiment, and creates fdf files that are written to the recon subdirectory of the current experiment when run in standalone mode, or to the study tree when run in study mode. If raw data output is selected (see option below), the resulting fdf files are written to the raw subdirectory of the current experiment.

Supported features include:

- Capable of running concurrently with acquisition (set acqstring to acq after first wnt; empty or dummy string initially).
- Disable image display (relevant parameter: recondisplay. Create in processed tree as a real variable and set it to 0)
- Display every N images (relevant parameter: recondisplay. Create in processed tree as a real variable and set it to N)
- DC removal (relevant parameter: dcrmv)
- Multi-shot/sorting (relevant parameters: petable, etl, and/or nseg)
- Multiple receiver data (magnitude sum) (relevant parameter: rcvrs)
- Weighting (through VnmrJ panel selections) (relevant parameter: ftproc)
- Zero filling (through VnmrJ panel selections) (relevant parameters: fn and/or fn1)
- Output magnitude and/or phase raw data components. (relevant (optional) parameter: raw. Create in processed tree as a string which can be set to 'm' (magnitude), 'p' (phase), or 'b' (both))
- Partial k-space conjugation. Relevant parameters are fract_kx and fract_ky, which denote the number of points/echoes acquired beyond the intended N/2. Example: nv=80, fract_ky=16 results in the central 32 echoes used as a correction map prior to conjugate synthesis. Resulting image has 128 (2*(80-16)) lines in the phase encoded direction.
- Phase correction. (relevant parameters: image, epi_pc) Implemented for epi sequences. Phase of transformed imaging data (image=1) is corrected by phase of transformed reference data (image=0). Accepted values for pc option in command string or for the optional parameter epi_pc are:

  1.POINTWISE (the default; direct use of the phase of profile)

  2.LINEAR (1st order fit of phase of profile)

  3.QUADRATIC (2nd order fit of phase of profile)

  4.CENTER_PAIR (even/odd pair at center of echo train used for all even/odd echoes)

5.PAIRWISE (even/odd pair phase differences along echo train used)

6.FIRST_PAIR (1st and 2nd echoes used for even/odd correction)

- Navigator Echo correction. Requires acquisition of *echo train* data (fsems, epi), some of which are not phase encoded. Adjusts phase of encoded echoes according to the phase of navigator echoes of the same echo train, relative to the first such navigator echo. Relevant parameters are:
- navigator (can be string set to 'y' or 'n', or array of integers giving navigator echo positions within the echo train (i.e., navigator=1,2).)
- nav_type (optional; string, set to 'off' to disable correction or 'POINTWISE' (default)).

Order of operation:

per echo in block

1.DC removal

2.echo reversal if necessary

3.raw data output if requested

4.windowing if necessary

5.read direction Fourier transform

6.phase correction if necessary

7.sorting if necessary

per slice

1.navigator correction if necessary

2.windowing in phase direction if necessary

3.partial Fourier correction if necessary

4.phase direction Fourier transform

5.accumulation of multi-receiver data

6.write fdf output file

Examples:

```
recon_all('','/usr/home/myimages')
recon_all('','/usr/home/myimages','CENTERPAIR')
recon_all('ignorethis','LINEAR')
recon_all('acq')
```

record — Record keyboard entries as a macro (M)

Syntax: `record<(file|'off')>`

Description: Records keyboard entries and stores the entries as a MAGICAL macro in the user's maclib directory. To start recording keyboard entries, enter record. You are prompted for a macro name (you can also give the name as an argument to record). The command line prompt then becomes "Command?" to indicate that the record macro is active. Type the MAGICAL commands to be recorded on the keyboard. Function keys can be included by entering F1 to F8 for function keys 1 to 8, respectively. Enter off or record('off') to finish the recording.

Arguments: file is the name of the macro file in which the entries are saved. The default is that the user is prompted for a file name. If the macro file name already exists, the user is asked if the file should be overwritten.

'off' is a keyword to stop recording the entries.

Examples:
```
record
record('mymacro')
record('off')
```

See also: *User Programming*

redor1 — Set up parameters for REDOR1 pulse sequence (M)

Applicability: Three-channel systems with a triple-tuned MAS solids probe.

Description: Sets up a parameter set, obtained withXPOLAR1, for REDOR (rotational echo double-resonance) experiment.

See also: *User Guide: Solid-State NMR*

Related:

xpolar1	Set up parameters for XPOLAR1 pulse sequence (M)

redosy — Restore 2D DOSY display from sub experiment (M)

Description: Restores the previous 2D DOSY display (if one exists) by recalling the data stored by the dosy macro in the file subexp/dosy2Ddisplay in the current experiment. undosy and redosy enable easy switching between the 1D DOSY data (spectra as a function of gzlvl) and the 2D DOSY display (signal as a function of frequency and diffusion coefficient).

See also: *NMR Spectroscopy User Guide*

Related:

dosy	Process DOSY experiments (M)
undosy	Restore original 1D NMR data from subexperiment (M)

reff1 — Reference f1 Indirect Dimension from Observe Dimension (M)

Syntax: `reff1<(refsource1)>`

Description: Macros uses the ratio of the Ξ values for the relevant nuclei from refsource1 or the reference source specified to determine the reference frequency in the f1 indirect dimension directly from the reference frequency in the observe dimension using the formula:

```
reffrq1 = (reffrq / Ξ[tn]) * Ξ[nucf1]
rfp1=0
rfl1 = sw1/2 - (frq[f1] - reffrq1)*1e6
```

Ξ is the normalized frequency such that the ^{1}H signal from TMS is 100.00 MHz.

Referencing in the observe dimension using setref and this method is same as using setref1 (apart from minor round-off errors).

Referencing the observe dimension to an internal reference standard as proposed by IUPAC references all dimensions to that single reference signal and not the lock as with setref, setref1, and setref2.

Limitations: the macro works with data recalled from an archive or acquired on an other system provided the data was acquired using VNMR6.1C or newer.

Referencing is based on nuctables/nuctabrefBio if bioref='y' (global or local). Setting bioref='n' (global or local) or if the flag does not exist the standard IUPAC / organic chemistry referencing (nuctables/nuctabref) is used.

See /vnmr/nuctables/nuctabref.

Arguments: No argument — reference source is determined from refsource1. If the relevant parameter is missing, the macro tries to determine the (indirect) reference source from the axis parameter.

'sfrq', 'dfrq', 'dfrq2', 'dfrq3', or 'dfrq4' as a reference source

Examples: `reff1 reff1('sfrq')`

Related:

`reff2`	Reference f2 Indirect Dimension from Observe Dimension (M)
`setref`	Set Frequency Referencing for Proton Spectra (M)
`setref1`	Set Frequency Referencing for f1 Evolution Dimension (M)
`setref2`	Set Frequency Referencing for f2 Evolution Dimension (M)
`mref`	Set Referencing Based on Spectrum from the same sample (M)
`bioref`	Flag for Bio-NMR Referencing (P)

`reff2` Reference f2 Indirect Dimension from Observe Dimension (M)

Syntax: `reff2<(refsource2)>`

Description: Macros uses the ratio of the Ξ values for the relevant nuclei from `refsource1` or the reference source specified to determine the reference frequency in the f1 indirect dimension directly from the reference frequency in the observe dimension using the formula:

```
reffrq1 = (reffrq / Ξ [tn]) * Ξ [nucf1]
rfp1=0
rfl1 = sw1/2 - (frq[f1] - reffrq1)*1e6
```

Ξ is the normalized frequency such that the ^{1}H signal from TMS is 100.00 MHz.

Referencing in the observe dimension using `setref` and this method is same as using `setref1` (apart from minor round-off errors).

Referencing the observe dimension to an internal reference standard as proposed by IUPAC references all dimensions to that single reference signal and not the lock as with `setref`, `setref1`, and `setref2`.

Limitations: the macro works with data recalled from an archive or acquired on an other system provided the data was acquired using VNMR6.1C or newer.

Referencing is based on `nuctables/nuctabrefBio` if `bioref='y'` (global or local). Setting `bioref='n'` (global or local) or if the flag does not exist the standard IUPAC / organic chemistry referencing (`nuctables/nuctabref`) is used.

See `/vnmr/nuctables/nuctabref`.

Arguments: No argument — reference source is determined from `refsource2`. If the relevant parameter is missing, the macro tries to determine the (indirect) reference source from the `axis` parameter.

`'sfrq'`, `'dfrq'`, `'dfrq2'`, `'dfrq3'`, or `'dfrq4'` as a reference source

Examples: `reff2('dfrq3')`

Related:

`reff1`	Reference f2 Indirect Dimension from Observe Dimension (M)
`setref`	Set Frequency Referencing for Proton Spectra (M)
`setref1`	Set Frequency Referencing for f1 Evolution Dimension (M)
`setref2`	Set Frequency Referencing for f2 Evolution Dimension (M)
`mref`	Set Referencing Based on Spectrum from the same sample (M)
`bioref`	Flag for Bio-NMR Referencing (P)

`reffrq` Reference frequency of reference line (P)

Description: Reference frequency, in MHz, of the reference line. This parameter is set by the `rl` macro. By defining `reffrq` as the conversion factor between Hz and ppm using the `unit` command, ppm calculations can be made.

If referencing is on (i.e., refpos is not set to 'n'), the go, ga, and au macros calculate values of rfl and rfp based on reffrq and refpos. If referencing is off, go, ga, and au set reffreq to sfrq.

See also: *NMR Spectroscopy User Guide*

Related:

au	Submit experiment to acquisition and process data (M)
crl	Clear reference line in directly detected dimension (M)
ga	Submit experiment to acquisition and FT the result (M)
go	Submit experiment to acquisition (M)
reffrq1	Ref. frequency of reference line in 1st indirect dimension (P)
reffrq2	Ref. frequency of reference line in 2nd indirect dimension (P)
refpos	Position of reference frequency (P)
rfl	Reference peak position in directly detected dimension (P)
rfp	Reference peak frequency in directly detected dimension (P)
rl	Set reference line in directly detected dimension (M)
sfrq	Transmitter frequency of observe nucleus (P)
unit	Define conversion units (C)

reffrq1 — Reference freq. of reference line in 1st indirect dimension (P)

Description: Reference frequency, in MHz, of the reference line in the first indirect dimension of a nD experiment. This parameter should be used as the conversion factor between hertz and ppm in the first indirect dimension.

See also: *NMR Spectroscopy User Guide*

Related:

crl1	Clear reference line in 1st indirectly detected dimension (M)
reffrq	Reference frequency of reference line (P)
refpos1	Position of reference frequency in 1st indirect dimension (P)

reffrq2 — Reference freq. of reference line in 2nd indirect dimension (P)

Description: Reference frequency, in MHz, of the reference line in the second indirect dimension of a 2D experiment. This parameter should be used as the conversion factor between hertz and ppm in the second indirect dimension.

See also: *NMR Spectroscopy User Guide*

Related:

crl2	Clear reference line in 2nd indirectly detected dimension (M)
reffrq	Reference frequency of reference line (P)
refpos2	Position of reference frequency in 2nd indirect dimension (P)

refpos — Position of reference frequency (P)

Description: Position of reference frequency, set by the setref and rl macros. Setting refpos='n' indicates that referencing has been turned off. The crl macro turns referencing off.

Values: Because all spectra are (by definition) referenced to a frequency at 0 ppm, refpos is either 0 or “not used”.

See also: *NMR Spectroscopy User Guide*

Related:

crl	Clear reference line in directly detected dimension (M)
reffrq	Reference frequency of reference line (P)
refpos1	Position of reference frequency in 1st indirect dimension (P)
refpos2	Position of reference frequency in 2nd indirect dimension (P)
rl	Set reference line indirectly detected dimension (M)
setref	Set frequency referencing (M)

refpos1 — Position of reference frequency in 1st indirect dimension (P)

Description: Position of reference frequency in the first indirect dimension of a nD experiment, set by setref1 and rl1 macros. Setting refpos1='n' indicates that f1 referencing has been turned off. The crl1 macro turns f1 referencing off.

Values: Because all spectra are (by definition) referenced to a frequency at 0 ppm, refpos1 is either 0 or "not used".

See also: *NMR Spectroscopy User Guide*

Related:

crl1	Clear reference line in 1st indirectly detected dimension (M)
reffrq1	Ref. frequency of reference line in 1st indirect dimension (P)
refpos	Position of reference frequency (P)
rl1	Set reference line in 1st indirect dimension (M)
setref1	Set frequency referencing for 1st indirectly detected dimension (M)

refpos2 — Position of reference frequency in 2nd indirect dimension (P)

Description: Position of reference frequency in the second indirect dimension of a 3D experiment, set by setref2 and rl2 macros. Setting refpos2='n' indicates that f2 referencing has been turned off in 3D spectra. The crl2 macro turns f2 referencing off.

Values: Because all spectra are (by definition) referenced to a frequency at 0 ppm, refpos2 is either 0 or "not used".

See also: *NMR Spectroscopy User Guide*

Related:

crl2	Clear reference line in 2nd indirectly detected dimension (M)
reffrq2	Ref. frequency of reference line in 2nd indirect dimension (P)
refpos	Position of reference frequency (P)
rl2	Set reference line in 2nd indirect dimension (M)
setref2	Set frequency referencing for 2nd indirectly detected dimension (M)

refsource1 — Center frequency in 1st indirect dimension (P)

Description: Holds a parameter name to be used as the center frequency in the first indirect dimension of 2D experiments. If refsource1 does not exist, the default is 'sfrq'.

For 2D experiments, the second dimension may be related to sfrq if it is a homonuclear experiment. The second dimension may also be related to dfrq if it is a heteronuclear experiment. refsource1 would then be set as refsource1='sfrq' and refsource1='dfrq', respectively.

See also: *NMR Spectroscopy User Guide*

Related:

dfrq	Transmitter frequency of first decoupler (P)
refsource2	Center frequency in 2nd indirect frequency (P)
sfrq	Transmitter frequency of observe nucleus (P)

refsource2 — Center frequency in 2nd indirect dimension (P)

Description: Holds a parameter name to be used as the center frequency in the second indirect dimension. refsource2 is analogous to refsource1

See also: *NMR Spectroscopy User Guide*

Related:

refsource1	Center frequency in 1st indirect dimension (P)

region — Divide spectrum into regions (C)

Syntax:
```
region<(tail_length,relative_number,threshold,
   number_points,tail_size)><:number_regions >
```

Description: Breaks a spectrum up into regions containing peaks.

Arguments: `tail_length` is the length from 0.0 to `sw`, in Hz, that is added to the start and end of each calculated peak region; default value is `sw/10`. The default value is used if a negative number is entered for this argument. If the addition of these wings would cause overlap between adjacent regions, the wings are reduced until the regions no longer overlap.

`relative_number` is a number that, in combination with other factors, governs the relative number of regions to be found. The default is 12, which is used if 0 is entered for this argument. `relative_number` is used as part of a test to determine whether two spectral areas containing peaks are close enough together to be represented as a single region. There are no strict rules that associate the value of `relative_number` to the total number of regions that will be found. In general, increasing this number decreases the number of regions that will be found and increases the size of an individual region. A value of `1` would give more regions; a value of `100` would give fewer regions.

`threshold` is a sensitivity factor used to decide if a data point is large enough, relative to the noise level, to qualify it as part of a peak. The default value is `0.6`, which is used if `0` is entered for this argument. Smaller values of `threshold` make peak selection more sensitive; larger values make peak selection less sensitive.

`number_points` governs the number of successive data points, normally from `7` to `40`, that must qualify as part of a peak (see the description of `threshold` above) in order for that spectral area to be considered a real peak. The default value is a function of `fn`, `sw`, weighting functions, and other values. The default is used if `0` is entered for this argument. For carbon spectra with large spectral windows, experimental peaks often contain only one or two data points. Adjust `number_points` to `1` or `2` in those cases.

`tail_size` is a number that, in combination with `relative_number` and other factors, governs whether two spectral areas that contain peaks are close enough together to be represented as a single region. The default value is used if `0` is entered for this argument.

`number_regions` is the total number of regions determined by `region`.

Examples:
```
region
region:$1
region(50,0,1)
region(-1,0,0,2):r1
```

See also: *NMR Spectroscopy User Guide*

Related:

`fn`	Fourier number in directly detection dimension (P)
`sw`	Spectral width in directly detected dimension (P)

relayh — Set up parameters for RELAYH pulse sequence (M)

Description: Sets up parameters for absolute-value COSY, or a single or double RELAY-COSY pulse sequence.

See also: *NMR Spectroscopy User Guide*

Related:

`Cosy`	Set up parameters for COSY pulse sequence (M)
`cosyps`	Set up parameters for phase-sensitive COSY (M)
`Dqcosy`	Set up parameters for double quantum filtered COSY (M)

rename — Move and/or rename a file (C)

Syntax: `rename(from_file,to_file)`

Description: Renames and/or moves a file or directory. `rename` is identical in function to the command `mv`.

Arguments: `from_file` is the name of the file to be moved to renamed.

`to_file` is the name of the file after moving or renaming it. If the `from_file` argument has an extension such as `.fid` or `.par`, be sure the `to_file` argument has the same extension.

Examples:
```
rename('/home/vnmr1/vnmrsys/seqlib/d2pul',
   '/vnmr/seqlib/d2pul')
```

See also: *NMR Spectroscopy User Guide*

Related:

`copy`	Copy a file (C)
`cp`	Copy a file (C)
`delete`	Delete a file, parameter directory, or FID directory (C)
`mv`	Move and/or rename a file (C)
`rm`	Delete file (C)

reqparcheck — Flag which enables/disables required parameters (P)

Syntax: `reqparcheck= 'y' or 'n'`

Description:

Description: The parameter reqparcheck is a flag with the possible values of 'y' or 'n'. Only if it is set to 'y' are actual parameters compared to the file. If it is set to 'n', reqpartest will always return 0.

Values: `'y'` or `'n'`, indicating whether required parameters are to be checked.

Related:

`callacq`	Utility macro to call Acq command (M)
`reqparlist`	List of required parameters (P)
`reqparclear`	Clears the parameters in required parameter list (M)
`reqpartest`	Tests whether required parameters are set (M)

reqparclear — Clears the parameters in required parameter list (M)

Syntax: `reqparclear`

Description: Clears the parameters listed in reqparlist. If for some reason reqparlist has been destroyed, then this macro exits without a message. The parameter is cleared on the current tree, if it exists there, or on the global tree, if it exists there. If it exists in neither place, a message is printed and the routine moves on to the next parameter in reqparlist.

The definition of "clear" is that real parameters are turned "off" and string parameters are set to the empty string ''.

There is a known issue with this macro, which due to its obscurity will remain as "user beware." The issue is that if a parameter of the same name exists in both the 'global' and 'current' trees, and if that parameter is part of reqparlist, then it will be cleared in the 'current' tree but not in the `global` tree. Users should just not be doing this.

Also note that while this macro checks for reqparlist='', if it is an array and any element in the array is '' then it assumes '' is a parameter and reports a "does not exist" message.

Related:		
	`callacq`	Utility macro to call Acq command (M)
	`reqparcheck`	Flag which enables/disables required parameters (P)
	`reqparlist`	List of required parameters (P)
	`reqpartest`	Tests whether required parameters are set (M)

`reqparlist` List of required parameters (P)

Description: The parameter reqparlist holds the parameter names. It is an array of strings. It will not array the experiment.

Related:		
	`callacq`	Utility macro to call Acq command (M)
	`gettoken`	Utility macro to separate a string into tokens (M)
	`reqparcheck`	Flag which enables/disables required parameters (P)
	`reqparclear`	Clears the parameters in required parameter list (M)
	`reqpartest`	Tests whether required parameters are set (M)

`reqpartest` Tests whether required parameters are set (M)

Syntax: `reqpartest<('showtext'|'showgui'<,callback_string>)>`

Description: If the parameter `reqparcheck='y'`, then this macro examines the list of parameter names in reqparlist and if all of them exist and are properly set, returns 0. Properly set is defined as a non- empty string for string parameters, or the active bit set (parameter is `'on'`) for real parameters.

This macro also checks the string which is the concatenation of `autoname + globalauto + sqname` for any parameters in that string. Parameters in this string are delimited by `$`.

For convenience, this macro will return different values depending on the specific non-true condition, as defined in the following table (X is "don't care").

All parameters exist	T	X	F	T	F
All parameters set	T	X	T	F	F
reqparcheck='y	'T	F	T	T	T
return value	0	-1	1	2	3

Also note that the non-existence of either reqparcheck or reqparlist is equivalent to reqparcheck not set to 'y'.

Parameters are checked in the current tree first for existence, and if that parameter exists there, then that tree is checked for whether it is set. If it does not exist in the current tree, then the global tree is checked. If and only if it exists in neither tree is it considered to not exist.

If the argument to this macro is `'showtext'` then if one or more parameters do not exist or are not properly set, then they are listed on the alphanumeric (text) screen.

If the argument to this macro is `'showgui'`, then an entry popup is displayed for both creation (of non-existing parameters) and value entry. The return value is not affected by the fact that the values are now being entered - in other words, the return value is to be interpreted as 'did not exist' or 'was not set' prior to running the macro.

The comprehensive list to check is `reqparlist+autoname+globalauto+sqname`. Some duplicates may occur, and this macro checks and eliminates duplicates.

The argument callback_string is an optional argument that gets passed onto VnmrJ, and then gets passed back to vnmrbg when the required parameters entry popup closes. VnmrJ and vnmrbg are not otherwise synchronized, so this allows for re-entrance.

Arguments: 'showgui'|showtext'

'showgui' displays an entry popup in the required parameter is not set;

'show text' displays information about the required parameters in the text window

callback_string — optional callback to vnmrbg from VnmrJ (ignored in 'showtext' option)

See also: *VnmrJ User Programming*

Related:

callacq	Utility macro to call Acq command (M)
reqparcheck	Flag which enables/disables required parameters (P)
reqparclear	Clears the parameters in required parameter list (M)

resetf3 — Reset parameters after a partial 3D Fourier transform (M)

Description: Restores the acquisition parameter sw, the processing parameter fn, and the display parameters sp, wp, rfl, and rfp in the 3D parameter set, which are read into VnmrJ by either the select command or the dplane or dproj macros. These parameters were modified due to the selection of regional f_3 processing (ptspec3d ='ynn'). The original value for each of these parameters is stored in the parameter $sv, where $ represents sw, fn, sp, wp, rfl, or rfp (e.g., swsv).

If a 2D plane into VnmrJ is retrieved from a 3D transformed data set that was processed with regional f_3 processing, resetf3 must be run before executing ft3d in that particular VnmrJ environment.

See also: *NMR Spectroscopy User Guide*

Related:

dplane	Display a 3D plane (M)
dproj	Display a 3D plane projection (M)
fn	Fourier number in directly detected dimension (P)
ft3d	Perform a 3D Fourier transform (M)
ptspec3d	Region-selective 3D processing (P)
rfl	Ref. peak position in directly detected dimension (P)
rfp	Ref. peak frequency in directly detected dimension (P)
select	Select a spectrum or 2D plane without displaying it (C)
sp	Start of plot (P)
sw	Spectral width in directly detected dimension (P)
vnmrjcmd()	Commands to invoke the GUI popup (C)
wp	Width of plot (P)

resetplotter — Reset plotter to system plotter (M)

Description: Command to reset a (temporarily chosen) plotter back to the system plotter sysplotter. Command is called by all plotfile/plotpreview and plot/autoplot buttons on plot panels.

resolv — Set resolution enhancement parameters (M)

Syntax: resolv<(a,b)>

Description: Calculates a default resolution enhancement function, setting up lb and gf based on the acquisition time at. "Zero-filling" is also accomplished, if possible, by making fn ≥>=2*np.

Arguments: a sets a value of lb using lb=-0.318/(a*sw). The default for a is 0.1.

b sets a value of gf using gf=b*sw. The default for b is 0.3.

Examples:
```
resolv
resolv(.2,.4)
```

See also: *NMR Spectroscopy User Guide*

Related:

at	Acquisition time (P)
fn	Fourier number in directly detected dimension (P)
gf	Gaussian function in directly detected dimension (P)
lb	Line broadening in directly detected dimension (P)
np	Number of data points (P)
sw	Spectral width in directly detected dimension (P)

restorenuctable Calculate & store accurate nuctable for current system (M)

Syntax: restorenuctable

Description: The setref contribution is a generic nucleus table, /vnmr/nuctables/nuctable, based on a standard proton frequency of 1000.0 MHz. All standard nucleus tables in the /vnmr/nuctables are symbolic links pointing to a generic table.

The restorenuctable is used to replace the standard links with specific links that to files containing proper and accurately calculated nucleus tables. Problems arising with custom macros and third party software that are not aware of the symbolic links pointing to a generic table can be fixed using this macro.

Commands and utilities that do not scale nuctable entries to the actual proton frequency (as they should) will work better than with the standard tables.

Limitations: restorenuctable is not compatible with qtune and certain commands in current software.

Examples:
```
restorenuctable
```

Related:

nuctable	Display nucleus table for a given H1 frequency (M)

resume Resume paused acquisition queue (C)

Description: Enables continuing submitting experiments to the acquisition system. For experiments initiated with the command au('wait'), the acquisition is paused during the time of data processing in order to prevent the acquisition from submitting new experiments that might be queued. resume then allows the data processing macro to initiate another acquisition with au('next'), which is then performed immediately instead of at the end of the queue.

See also: *NMR Spectroscopy User Guide*

Related:

au	Submit experiment to acquisition and process data (C)

return Terminate execution of a macro (C)

Syntax: return<(expression1,expression2,...)>

Description: Terminates the execution of a macro and optionally returns values to another calling macro. This is usually used after testing some condition. return is used only in macros and not entered from the keyboard.

Arguments: `expression1,expression2,...` are return values to another calling macro.

See also: *User Programming*

Related: `abort` Terminate action of calling macro and all higher macros (C)

rev — System software revision level (P)

Description: Stores a string identifying the VnmrJ software version for the system. This parameter is not be entered by the user, but can be examined by entering `rev?`.

See also: *VnmrJ Installation and Administration*

Related: `revdate` System software preparation date (P)

revdate — System software preparation date (P)

Description: Stores a string identifying the date the current VnmrJ software version was prepared. This parameter is not be entered by the user, but can be examined by entering `revdate?`.

See also: *VnmrJ Installation and Administration*

Related: `rev` System software revision level (P)

rfband — RF band in use (P)

Description: Indicates which rf band of the amplifier is in use for each channel.

Values: A string, such as `'hlc'`, in which the first channel is determined by the first character, the second channel is determined by the second character, and so forth. The following values are available for each channel:

`'h'` indicates the high rf band is in use on the channel.

`'l'` indicates the low rf band is in use on the channel.

`'c'` indicates the system software will calculate whether to use the high band or the low band for the channel.

See also: *NMR Spectroscopy User Guide*

rfblk — Reverse FID block (C)

Syntax: `rfblk(<src_expno>,src_blk_no,dest_expno,dest_blk_no)`

Description: Reverses and copies data from a source FID block specified by `src_blk_no` to a destination FID block specified by `dest_expno` and `dest_blk_no`, using memory-mapped input and output. The file header determines the size and type of data to reverse.

`rfblk` searches for the source and destination FID file in the directory `$vnmruser/expN/acqfil`; `N` is the requested experiment number or the current experiment number. If the FID file is not open, `rfblk` opens the file, copies the data, and closes the file. If a number of blocks need to be copied, explicitly opening and closing the files with the commands `mfopen` and `mfclose` can significantly speed up the data reformatting process.

`rfblk` can also be used to append blocks of data to a FID file by specifying that the `dest_blk_no` is greater than the number of blocks in a file.

Be aware that `rfblk` can modify data returned to an experiment with the `rt` command. To avoid modification, enter the following sequence of commands before running `rfblk`:

```
cp(curexp+'/acqfil/fid',curexp+'/acqfil/fidtmp')
rm(curexp+'/acqfil/fid')
mv(curexp+'/acqfil/fidtmp',curexp+'/acqfil/fid')
```

Arguments: `src_expno` specifies the experiment number of the source FID file. The default is the FID file of the current experiment.

`src_blk_no` specifies the source block of data to be copied. Block numbers run from 1 to the number of blocks in a file.

`dest_expno` specifies the experiment number of the destination FID file.

`dest_blk_no` specifies the destination block to send the copied data.

Examples: `rfblk(1,2,1)` reverses and copies block 1 from the current experiment to block 1 of experiment 2.

See also: *User Programming*

Related:

`mfblk`	Move FID block (C)
`mfclose`	Memory map close FID file (C)
`mfdata`	Move FID data (C)
`mfopen`	Memory map open FID file (C)
`mftrace`	Move FID trace (C)
`rfdata`	Reverse FID data (C)
`rftrace`	Reverse FID trace (C)

`rfchannel` Independent control of rf channel selection (P)

Description: Gives override capability over the selection of rf channels. `rfchannel` does not normally exist but can be created by a user with the command `create('rfchannel','flag')`.

The control of each rf channel is built around a collection of parameters and pulse sequence statements. The frequency of channel 1 is set by `sfrq` and `tof`, its power by `tpwr` and `tpwrf`. The first decoupler uses the corresponding parameters `dfrq`, `dof`, `dpwr`, and `dpwrf`, respectively. Furthermore, the decoupler can have modulation modes specified with the parameters `dmf`, `dm`, `dmm`, `dres`, and `dseq`,. The second decoupler has the same set of parameters as the first decoupler and they are distinguished by appending a 2 to each name. That is, the names aer `dfrq2`, `dof2`, `dpwr2`, `dpwrf2`, `dmf2`, `dm2`, `dmm2`, `dres2`, and `dseq2`. The third decoupler would use parameters with a 3 appended: `dfrq3`, `dof3`, `dpwr3`, `dpwrf3`, `dmf3`, `dm3`, `dmm3`, `dres3`, and `dseq3`. The `rfchannel` parameter provides a mechanism to override the default parameter usage.

Values: A string of one to four characters in which the position of each character identifies the rf channel controlled.

- The first character selects which rf channel (1 to 4) the parameters `sfrq`, `tof`, `tpwr`, etc. control. The first character also identifies the rf channel used as the receiver.
- The second character selects which rf channel (1 to 4) the parameters `dfrq`, `dof`, `dpwr`, etc. control.
- The third character maps the parameter set `dfrq2`, `dof2`, `dpwr2`, etc. to an rf channel (1 to 4).
- The fourth character maps t`dfrq3`, `dof3`, `dpwr3`, etc. to an rf channel (1 to 4).

For example, `rfchannel='132'` would exchange control of the second and third rf channels from the default parameter usage.

The number of characters in the rfchannel parameter must match the number of real rf channels (defined by the parameter numrfch) and each rf channel must be selected by the parameter.

Besides remapping the parameters to different rf channels, pulse sequence statements are also remapped. For example, if rfchannel='132', then statements decpulse, decshaped_pulse, decoffset, decpower, decspinlock, and so on are applied on rf channel 3 and dec2pulse, dec2shaped_pulse, and so on are applied on rf channel 2.

An obvious use for this remapping is on systems with the decoupler set to U+ H1 Only in the Spectrometer Configuration window. On these systems, if multinuclear pulses are needed and ^{1}H needs to be observed, the parameter sets that assume a dual-broadband system can be used and the parameters remapped by setting rfchannel='21'. However, internal logic checks if the first decoupler is set to U+ H1 Only, tn is set to 'H1', and dn is not set to 'H1'. If these settings are the case, the parameter mapping for rf channels 1 and 2 is exchanged automatically.

See also: *NMR Spectroscopy User Guide; User Programming*

Related:

create	Create new parameter in parameter tree (C)
dfrq	Transmitter frequency for first decoupler (P)
dm	Decoupler mode for first decoupler (P)
dmf	Decoupler modulation frequency for first decoupler (P)
dmm	Decoupler modulation mode for first decoupler (P)
dn	Nucleus for first decoupler (P)
dof	Frequency offset for first decoupler (P)
dpwr	Power level for first decoupler with linear amplifier (P)
dpwrf	First decoupler fine power (P)
dres	Tip-angle resolution for first decoupler (P)
dseq	Decoupler sequence for first decoupler (P)
numrfch	Number of rf channels (P)
sfrq	Transmitter frequency for observe nucleus (P)
tn	Nucleus for observe transmitter (P)
tof	Frequency offset for observe transmitter (P)
tpwr	Observe transmitter power level with linear amplifiers (P)
tpwrf	Observe transmitter fine power (P)

rfchtype — Type of rf channel (P)

Description: Configuration parameter for type of rf on each channel. The value for a channel is set using the Type of RF label in the Spectrometer Configuration window. Pulse sequence programs check rfchtype to determine if indirect detection should be used for some experiments. Indirect detection occurs automatically if the decoupler is set to U+ H1 Only in the Spectrometer Configuration window, tn is set to 'H1', and dn is not set to 'H1'.

Values: The values of rfchtype parallel the rftype values. The only distinction is that the setting for rftype is 'd' on the U+ Direct Synthesis and U+ H1 Only entries.

'U+ Direct Synthesis' is the setting for a system with direct synthesis (U+ Direct Synthesis in the Spectrometer Configuration window).

'U+ H1 Only' is a fixed-frequency proton system (U+ H1 Only in Spectrometer Configuration window).

'Deuterium Decoupler' is the setting for a system deuterium decoupler channel.

'Direct Synthesis' is the setting for direct synthesis (Direct Synthesis in the Spectrometer Configuration window).

'Broadband' is the setting for broadband (Broadband in the Spectrometer Configuration window).

'Fixed Frequency' is the setting for fixed frequency (Fixed Frequency in the Spectrometer Configuration window).

'SIS Modulator' is the setting for imaging modulator (SIS Modulator in the Spectrometer Configuration window).

See also: *VnmrJ Installation and Administration*

Related:		
	config	Display current configuration and possibly change it (M)
	dn	Nucleus for first decoupler (P)
	rftype	Type of rf generation (P)
	tn	Nucleus for observe transmitter (P)

rfdata — Reverse FID data (C)

Syntax:
```
rfdata(<src_expno,>src_blk_no,src_start_loc,  \
  dest_expno,dest_blk_no,dest_start_loc,num_points)
```

Description: Reverses and copies data specified by `src_start_loc` from a FID block specified by `src_blk_no` to a destination location specified by `dest_expno`, `dest_blk_no`, and `dest_start_loc`, using memory-mapped input and output. The data point locations and the `num_points` to be reversed are specified by data points corresponding to the `np` parameter, not bytes or complex points; however, when reversing the data, `rfdata` looks at the file header to determine the size and type of data to reverse.

`rfdata` searches for the source and destination FID file in the directory `$vnmruser/expN/acqfil`; `N` is the requested experiment number or the current experiment number. If the FID file is not open, `rfdata` opens the file, copies the data, and closes the file. If a number of blocks need to be copied, explicitly opening and closing the files with the commands `mfopen` and `mfclose` can significantly speed up the data reformatting process.

Be aware that `rfdata` can modify data returned to an experiment with the `rt` command. To avoid modification, enter the following sequence of commands before running `rfdata`:

```
cp(curexp+'/acqfil/fid',curexp+'/acqfil/fidtmp')
rm(curexp+'/acqfil/fid')
mv(curexp+'/acqfil/fidtmp',curexp+'/acqfil/fid')
```

Arguments: `src_expno` specifies the experiment number of the source FID file. The default is the FID file of the current experiment.

`src_blk_no` specifies the source block of data to be copied. Block numbers run from 1 to the number of blocks in a file.

`src_start_loc` specifies the starting data location within the specified block to copy the data. Data locations start from 0 and are specified as data points corresponding to the `np` parameter.

`dest_expno` specifies the experiment number of the destination FID file.

`dest_blk_no` specifies the destination block to send the copied data.

`dest_start_loc` specifies the starting data destination location within the specified block to send the copied data.

Examples: `rfdata(1,0,2,1,(nv-1)*np,np)` copies and reverses `np` points of data from the starting location 0 of block 1 of the current experiment to the data location `(nv-1)*np` of block 1 of experiment 2.

See also: *User Programming*

Related:		
	mfblk	Move FID block (C)
	mfclose	Memory map close FID file (C)

mfdata	Move FID data (C)
mfopen	Memory map open FID file (C)
mftrace	Move FID trace (C)
rfblk	Reverse FID block (C)
rftrace	Reverse FID trace (C)

rfl — Reference peak position in directly detected dimension (P)

Description: Actual position of the reference line in the spectrum (i.e., the distance from the right edge of the spectrum to the reference line). If there is no reference line in the spectrum, rfl can be used to enter the frequency where the reference line would appear if the line were present in the spectrum.

Values: Number, in Hz.

See also: *NMR Spectroscopy User Guide*

Related:

rfl1	Reference peak position in 1st indirectly detected dimension (P)
rfl2	Reference peak position in 2nd indirectly detected dimension (P)
rfp	Reference peak frequency in directly detected dimension (P)

rfl1 — Reference peak position in 1st indirectly detected dimension (P)

Description: Analogous to the rfl parameter except that rfl1 applies to the first indirectly detected dimension of a multidimensional data set. rfl1 can either be set manually or be adjusted automatically when the macro rl1 is used to assign a reference line.

Values: Number, in Hz.

See also: *NMR Spectroscopy User Guide*

Related:

rfl	Reference peak position in directly detected dimension (P)
rfl2	Reference peak position in 2nd indirectly detected dimension (P)
rfp1	Reference peak frequency in 1st indirectly detected dimension (P)

rfl2 — Reference peak position in 2nd indirectly detected dimension (P)

Description: Analogous to the rfl parameter except that rfl2 applies to the second indirectly detected dimension of a multidimensional data set. rfl2 can either be set manually or be adjusted automatically when the macro rl2 is used to assign a reference line.

Values: Number, in Hz.

See also: *NMR Spectroscopy User Guide*

Related:

rfl	Reference peak position in directly detected position (P)
rfl1	Reference peak position in 1st indirectly detected dimension (P)
rfp2	Reference peak frequency in 2nd indirectly detected dimension (P)

rfp — Reference peak frequency in directly detected dimension (P)

Description: Sets the frequency to be assigned to the reference line in the spectrum. rfp is always stored in Hz, but can be entered in ppm by using the p suffix (e.g., rfp=2.1p).

Values: Number, in Hz.

See also: *NMR Spectroscopy User Guide*

Related:

rfl	Reference peak position in directly detected dimension (P)
rfp1	Ref. peak frequency in 1st indirectly detected dimension (P)

rfp2	Ref. peak frequency in 2nd indirectly detected dimension (P)
rl	Set reference line in directly detected dimension (M)

rfp1 Reference peak freq. in 1st indirectly detected dimension (P)

Description: Analogous to the rfp parameter except that rfp1 applies to the first indirectly detected dimension of a multidimensional data set. rfp1 can either be set manually or be assigned a value when rl1 is called with an argument (e.g., rl1(7.2p) assigns the value of 7.2 ppm to rfp1).

Values: Number, in Hz.

See also: *NMR Spectroscopy User Guide*

Related:

rfl1	Ref. peak position in 1st indirectly detected dimension (P)
rfp	Ref. peak frequency in directly detected dimension (P)
rfp2	Ref. peak frequency in 2nd indirectly detected dimension (P)
rl1	Set reference line in 1st indirectly detected dimension (M)

rfp2 Reference peak freq. in 2nd indirectly detected dimension (P)

Description: Analogous to the rfp parameter except that rfp2 applies to the second indirectly detected dimension of a multidimensional data set. rfp2 can be set manually or be assigned a value when rl2 is called with an argument. For example, entering rl2(7.2p) assigns the value of 7.2 ppm to rfp2.

Values: Number, in Hz.

See also: *NMR Spectroscopy User Guide*

Related:

rfl2	Reference peak position in 2nd indirectly detected dimension (P)
rfp	Reference peak frequency in directly detected dimension (P)
rfp1	Reference peak frequency in 1st indirectly detected dimension (P)
rl2	Set reference line in 2nd indirectly detected dimension (C)

rftrace Reverse FID trace (C)

Syntax:
```
rftrace(<src_expno,src_blk_no,src_trace_no,   \
  dest_expno,<dest_blk_no,dest_trace_no)
```

Description: Reverses and copies FID traces specified by src_trace_no from a FID block specified by src_blk_no to a destination location specified by dest_expno, dest_blk_no, and dest_trace_no, using memory-mapped input and output. The file header determines the size and type of data to be reversed.

rftrace searches for the source and destination FID file in the directory $vnmruser/expN/acqfil; N is the requested experiment number or the current experiment number. If the FID file is not open, rftrace opens the file, copies the data, and closes the file. If a number of blocks need to be copied, explicitly opening and closing the files with the commands mfopen and mfclose can significantly speed up the data reformatting process.

You cannot use rftrace to append data to a FID file. Its purpose is for moving around data.

Be aware that rftrace can modify data returned to an experiment with the rt command. To avoid modification, enter the following sequence of commands before running rftrace:

```
cp(curexp+'/acqfil/fid',curexp+'/acqfil/fidtmp')
rm(curexp+'/acqfil/fid')
mv(curexp+'/acqfil/fidtmp',curexp+'/acqfil/fid')
```

Arguments: src_expno specifies the experiment number of the source FID file. The default is the FID file of the current experiment.

src_blk_no specifies the source block of data to be copied. Block numbers run from 1 to the number of blocks in a file.

src_trace_no specifies the source trace of data within the specified block to be copied. Trace numbers run from 1 to number of traces in a file.

dest_expno specifies the experiment number of the destination FID file.

dest_blk_no specifies the destination block to send the copied data.

src_trace_no specifies the destination trace of data within the specified block to be copied. Trace numbers run from 1 to the number of traces in a file.

Examples: rftrace(1,1,2,1,nv) copies and reverses trace 1 from block 1 of the current experiment to trace nv of block 1 of experiment 2.

See also: *User Programming*

Related:

mfblk	Move FID block (C)
mfclose	Memory map close FID file (C)
mfdata	Move FID data (C)
mfopen	Memory map open FID file (C)
mftrace	Move FID trace (C)
rfblk	Reverse FID block (C)
rfdata	Reverse FID data (C)

rftype — Type of rf generation (P)

Description: Configuration parameter for type of rf generation on each rf channel. On other systems, the value is set using the Type of RF label in the Spectrometer Configuration window.

Values: The values of rftype parallel the rfchtype values. The setting for rftype is 'd' on the entries U+ Direct Synthesis and U+ H1 Only.

'd' is the setting for a system with direct synthesis (U+ Direct Synthesis in the Spectrometer Configuration window) or a fixed-frequency proton system (U+ H1 Only in Spectrometer Configuration window).

'l' is the setting for a deuterium decoupler channel.

'c' is the setting for direct synthesis (Direct Synthesis in the Spectrometer Configuration window).

'b' is the setting for broadband (Broadband in the Spectrometer Configuration window).

'a' is the setting for fixed frequency (Fixed Frequency in the Spectrometer Configuration window).

'm' is the setting for imaging modulator (SIS Modulator in the Spectrometer Configuration window).

See also: *VnmrJ Installation and Administration*

Related:

config	Display current configuration and possibly change it (M)
rfchtype	Type of rf channel (P)

rfwg — RF waveform generator (P)

Description: Configuration parameter for whether a waveform generator board is present or not on the current rf channel. The value for each channel is set using the Waveform Generator label in the Spectrometer Configuration window.

Values: 'n' is setting for no waveform generator board on the channel (Not Present choice in Spectrometer Configuration window).

'y' is setting for a waveform generation board on the channel (Present choice in Spectrometer Configuration window).

See also: *VnmrJ Installation and Administration*

Related:

config	Display current configuration and possibly change it (M)

right — Set display limits to right half of screen (C)

Description: Sets the horizontal control parameters, sc and wc, to produce a display (and subsequent plot) in the right portion of the screen (and page). For 2D data, space is left for the scales.

See also: *NMR Spectroscopy User Guide*

Related:

center	Set display limits for center of screen (C)
full	Set display limits for a full screen (C)
fullt	Set display limits for full screen with room for traces (C)
left	Set display limits for left half of screen (C)
sc	Start of chart (P)
wc	Width of chart (P)

rights — Determine an operator's specified right (C)

Applicability: Walkup

Syntax: `rights('right'<,'errval'>)<:$ret>`

Description: The rights program queries the rights database to determine if the current operator has the specified right. This command is used by the interface designer to determine if and how certain options are presented. An operator does not typically use this command. The system administrator sets (restricts) the rights for an operator using VnmrJ administrator interface. By default, the rights command grants any requested right. Rights requested that are not in the rights database are granted. Granting a right means that the rights program returns a 1 to the calling macro.

Arguments: right — a specific operator right, not case sensitive.

- 1 is returned by the command if the specified right is granted or the right is not in the rights data base
- 0 is default value returned by the command if the right is both in the database and the operator does not have the specified right.

errval — optional argument specifying return value if a right is both in the database and the operator does not have the specified right.

$ret — variable holding the return value from the right command.

Examples: `rights('prioritySample',-1):$ok`

Sets $ok to -1 if the prioritySample right is not granted. A value of 1 is returned if the prioritySample is granted. Returning either a 0 or -1 if a right is not granted lets the interface designer choose to show or gray out a control.

See also: *VnmrJ Installation and Administration* and *VnmrJ Walkup* manuals.

rinput — Input data for a regression analysis (M)

Description: Formats data for regression analysis and places the data into the file regression.inp. The program is interactive. If a regression.inp already exists, rinput starts by asking if you want to overwrite the file. Type *y* and press the Return key. It then asks for an x-axis title and a y-axis title. Enter

the titles as asked (for no title, simply press Return). Next, rinput asks you to input the data in pairs. Separate each pair of values with a blank and press Return after the second value. At the end of the data set, press Return in response to the request for data. If you have another data set, type *y* and press Return to the question and then type in the data when it is asked for.

See also: *NMR Spectroscopy User Guide; User Programming*

Related:

expl	Display exponential or polynomial curves (C)
poly0	Find mean of data in the file *regression.inp* (C)

rl — Set reference line in directly detected dimension (M)

Syntax: rl<(frequency)>

Description: Sets the direct dimension reference line, taking into account any frequency scaling with the scalesw parameter.

Arguments: frequency is a value, in Hz, to assign to the reference line. The default is the cursor position cr. To enter the value in ppm, add a p suffix.

Examples:
```
rl
rl(0)
rl(7.2p)
```

See also: *NMR Spectroscopy User Guide*

Related:

cr	Current cursor position in directly detected dimension (P)
crl	Clear ref. line in directly detected dimension (C)
reffrq	Reference frequency of the reference line (P)
rl1	Set ref. line in 1st indirectly detected dimension (M)
rl2	Set ref. line in 2nd indirectly detected dimension (M)
scalesw	Scale spectral width in directly detected dimension (P)

rl1 — Set reference line in 1st indirectly detected dimension (M)

Syntax: rl1<(frequency)>

Description: Sets the first indirect dimension reference line, taking into account any frequency scaling with the scalesw1 parameter.

Arguments: frequency is a value, in Hz, to assign to the reference line. The default is the cursor position cr1. You can enter the suffixes p, d, or k to mean ppm, decoupler ppm, and kilo, respectively. These suffixes are exactly equivalent to using *sfrq, *dfrq, and *1000. Thus, if you are doing a 2D experiment in which the indirect axis is determined by the decoupler channel, you might enter, for example, rl1(10d), which is equivalent to rl1(10*dfrq).

Examples:
```
rl1
rl1(0)
rl1(7.2p)
```

See also: *NMR Spectroscopy User Guide*

Related:

cr1	Cursor position in 1st indirectly detected dimension (P)
crl1	Clear ref. line in 1st indirectly detected dimension (M)
dfrq	Transmitter frequency of first decoupler (P)
refpos2	Position of reference frequency in 2nd indirect dimension (P)
rl	Set ref. line in directly detected dimension (M)
rl2	Set ref. line in 2nd indirectly detected dimension (M)
scalesw1	Scale spectral width in 1st indirectly detected dimension (P)
sfrq	Transmitter frequency of observe nucleus (P)

rl2 — Set reference line in 2nd indirectly detected dimension (M)

Syntax: `rl2<(frequency)>`

Description: Sets the second indirect dimension reference line, taking into account any frequency scaling with the `scalesw2` parameter.

Arguments: `frequency` is a value, in Hz, to assign to the reference line. The default is the cursor position `cr2`. You can enter the suffixes `p`, `d`, or `k` to mean ppm, decoupler ppm, and kilo, respectively. These suffixes are exactly equivalent to using `*sfrq`, `*dfrq`, and *1000. Because there is no suffix for the second decoupler (i.e., the third channel), to reference the third axis using `rl2` you might enter (e.g., `rl2(45*dfrq2)`).

Examples:
```
rl2
rl2(0)
rl2(7.2p)
```

See also: *NMR Spectroscopy User Guide*

Related:

`cr2`	Cursor position in 2nd indirectly detected dimension (P)
`crl`	Clear ref. line in directly detected dimension (C)
`crl1`	Clear ref. line in 1st indirectly detected dimension (C)
`crl2`	Clear ref. line in 2nd indirectly detected dimension (C)
`dfrq`	Transmitter frequency of first decoupler (P)
`dfrq2`	Transmitter frequency of second decoupler (P)
`rl`	Set ref. line in directly detected dimension (M)
`rl1`	Set ref. line in 1st indirectly detected dimension (M)
`scalesw2`	Scale spectral width in 2nd indirectly detected dimension (P)
`sfrq`	Transmitter frequency of observe nucleus (P)

rm — Delete file (C)

Syntax: `rm(file1<,file2,...>)`

Description: Removes one or more files from the file system, functioning like the UNIX command of the same name. Because it allows wildcard characters (* and ?) in the command argument and recursive file deletion with the `-r` option, `rm` is very powerful. But it can be quite dangerous—without warning important files can be inadvertently deleted, even by experienced users. **Using `rm` to delete files in VnmrJ is not recommended**. The `delete` command is provided as a safer alternative.

Arguments: `file1,file2,...` are names of files to delete.

See also: *NMR Spectroscopy User Guide*

Related:

`delete`	Delete a file, parameter directory, or FID directory (C)
`delexp`	Delete an experiment (C)
`exists`	Determine if a parameter, file, or macro exists (C)
`mv`	Move and/or rename a file (C)
`rename`	Move and/or rename a file (C)

rmdir — Remove directory (C)

Syntax: `rmdir(directory)`

Description: Removes one or more empty directories (i.e., directories without files).

Arguments: `directory` is the name of the directory to be removed.

Examples:
```
rmdir('/home/dan/temp')
```

See also: *NMR Spectroscopy User Guide*

Related:

`delete`	Delete a file, parameter directory, or FID directory (C)
`dir`	List files in current directory (C)
`lf`	List files in current directory (C)
`ls`	List files in current directory (C)
`mkdir`	Create new directory (C)

`rmsAddData` Add transformed data files with weighting (U)

Applicability: Systems with multiple receivers.

Description: This command is not normally executed directly by the user.

`Roesy` Convert the parameter to a ROESY experiment (M)

Description: Convert the parameter to a rotating frame Overhauser effect spectroscopy (ROESY) experiment.

`Roesy1d` Convert the parameter set to a Roesy1d experiment (M)

Description: Convert the parameter set to a 1D rotating frame Overhauser effect spectroscopy (Roesy1D) experiment.

See also: *NMR Spectroscopy User Guide*

Related:

`Proton`	Set up parameters for ^{1}H experiment (M).
`sel1d`	Selective 1D protocols to set up (M).

`rof1` Receiver gating time preceding pulse (P)

Description: Sets the period of time in most pulse sequences when the receiver is gated off before each pulse. This allows the amplifier to fully turn on before the start of the pulse. Systems are configured with linear amplifiers that are normally "blanked" to give the best possible signal-to-noise (i.e., the amplifiers are turned off when the receiver is turned on). The $^{1}H/^{19}F$ amplifiers have a short turn-on time, usually 1 to 5 µs following the removal of blanking by turning the receiver off. The low-frequency amplifier modules have a longer turn-on time, about 40 to 60 µs.

Values: Typically 2-5 microseconds.

See also: *NMR Spectroscopy User Guide*

Related:

`rof2`	Receiver gating time following pulse (P)

`rof2` Receiver gating time following pulse (P)

Description: Sets the time after the final pulse in each pulse sequence that the receiver is gated off before acquisition begins. If "pulse breakthrough" effects are seen (a spike in the beginning of the FID), increasing `rof2` can reduce or eliminate the problem, particularly for low-frequency nuclei.

Values: Typically 10 microseconds.

See also: *NMR Spectroscopy User Guide*

Related:

`rof1`	Receiver gating time preceding pulse (P)
`setlp0`	Set parameters for zero linear phase (M)

rof3 — Receiver gating time following T/R switch (P)

Description: Sets the time when the receiver is gated on following the T/R switch during the pulse. This allows for the elimination of pulse artifacts during the acquisition period.

rotate — Rotate 2D data (C)

Syntax: `rotate<(number_degrees)>`

Description: Rotates a 2D spectrum. Both complex and hypercomplex 2D data will work.

Arguments: `number_degrees` is the amount of counter-clockwise rotation, in degrees. The default is 45.

See also: *NMR Spectroscopy User Guide*

Related:

`foldcc`	Fold INADEQUATE data about 2-quantum axis (C)
`foldj`	Fold J-resolved 2D spectrum about *f1=0* axis (C)
`foldt`	Fold COSY-like spectrum along diagonal axis (C)

rotorsync — Rotor synchronization (P)

Applicability: Systems with the solids rotor synchronization module.

Description: Configuration parameter that identifies if the system has the optional solids rotor synchronization module. The value of `rotorsync` is set using the Rotor Synchronization label in the Spectrometer Configuration window. Rotor synchronization requires either the Acquisition Controller board (Part No. 969204) or the Pulse Sequence Controller board (Part No. 992560) in the system.

Values: `1` is setting that system has solids rotor synchronization (Present choice in the Spectrometer Configuration window).

`0` is setting that system does not have solid rotor synchronization (Not Present choice in the Spectrometer Configuration window).

See also: *VnmrJ Installation and Administration*

Related:

`config`	Display current configuration and possibly change it (M)

rp — Zero-order phase in directly detected dimension (P)

Description: Specifies the right phase-correction angles along the directly detected dimension according to

absorption spectrum(ω) =
real channel(ω) * *sin* θ + *imaginary channel(ω)* * *cos* θ

where the phase angle θ is a function of frequency:

$\theta = \texttt{rp} + (\omega - \omega_o) * \texttt{lp}$

ω_o is defined as the right end of the spectrum. This dimension is referred to as the f_2 dimension in 2D data sets, f_3 dimension in 3D data sets, and so on.

Values: –360 to +360, in degrees.

See also: *NMR Spectroscopy User Guide*

Related:

`aph`	Automatic phase adjustment of spectra (C)
`aph0`	Automatic phase of zero-order term (C)
`lp`	First-order phase in directly detected dimension (P)
`rp1`	Zero-order phase in 1st indirectly detected dimension (P)
`rp2`	Zero-order phase in 2nd indirectly detected dimension (P)
`setlp0`	Set parameters for zero linear phase (M)

rp1 — Zero-order phase in 1st indirectly detected dimension (P)

Description: Specifies the right phase parameter along the first indirectly detected dimension, in degrees, for the f_1 dimension of a multidimensional data set during the process of phase-sensitive 2D transformation.

See also: *NMR Spectroscopy User Guide*

Related:

lp1	First-order phase in 1st indirectly detected dimension (P)
rp	Zero-order phase in directly detected dimension (P)
rp2	Zero-order phase in 2nd indirectly detected dimension (P)

rp2 — Zero-order phase in 2nd indirectly detected dimension (P)

Description: Controls the zero-order phase constant along the second indirectly detected dimension during a ds, dconi, or equivalent display operation on the 2D data or a 1D trace therein. This dimension is often referred to as the f_2 dimension.

See also: *NMR Spectroscopy User Guide*

Related:

dconi	Interactive 2D contour display (C)
ds	Display a spectrum (C)
lp2	First-order phase in 2nd indirectly detected dimension (P)
rp	Zero order phase in directly detected dimension (P)

rt — Retrieve FIDs (M)

Syntax: `rt<(file<,'nolog'>)>`

Description: Retrieves FIDs from a file into the current experiment.

The `rt` macro does not copy the FID into the experiment. Instead, it links access to the original FID from the experiment. Most of the time, this behavior is desired, because the FID file is seldom changed. By making a link, disk space is also conserved. However, if the FID file in the experiment is written to, the data in the original file is also written to. It is best to make a copy of a FID file before altering it. The `makefid` command alters the FID file. The manual entry for `makefid` gives details on how to make a copy of the FID.

As another somewhat subtle point, because the FID in the experiment is a link to another .fid file, if that .fid file is removed, the link from the experiment may be gone. If you expect the FID in the experiment to be there, even if you delete the .fid file from where it was retrieved using `rt`, you should explicitly copy the file into the experiment.

Arguments: `file` is the name of the file that, with the suffix `.fid` added, contains the FIDs to be retrieved. The default is that the system prompts for the name (in that case, the name can be given without single quotes). If `file.fid` does not exist and `file.par` does, `rt` retrieves the parameters from `file.par`.

`'nolog'` is a keyword specifying that the log file is not to be retrieved.

Examples:

```
rt
rt('/vnmr/fidlib/fid1d')
```

See also: *NMR Spectroscopy User Guide*

Related:

fixpar	Correct parameter characteristics in experiment (M)
makefid	Make a FID element using numeric text input (C)
rtp	Retrieve parameters (M)
rtv	Retrieve individual parameters (C)
svf	Save FIDs in current experiment (M)

rtcmx — Return Spinsight data into current experiment (C)

Syntax: `rtcmx<(file)>`

Description: Retrieves Spinsight data into the current experiment.

Arguments: `file` is the name of the file. The default is that the macro prompts for the file name.

Alternate: Load button in the `files` program.

Examples:
```
rtcmx
rtcmx('redor.data')
```

See also: *NMR Spectroscopy User Guide*

Related:

`files`	Interactively handle files (C)

rtp — Retrieve parameters (M)

Syntax: `rtp<(file)>`

Description: Retrieves parameters from a file into the current experiment.

Arguments: `file` is the name of the file that, with the suffix `.par` added, contains the parameters to be retrieved;. The default is that the system prompts for the name (in that case, the name can be given without single quotes). If `file.par` does not exist and `file.fid` does, `rtp` retrieves the parameters only from `file.fid`.

Examples:
```
rtp
rtp('/vnmr/stdpar/P31')
```

See also: *NMR Spectroscopy User Guide*

Related:

`fixpar`	Correct parameter characteristics in experiment (M)
`rt`	Retrieve FIDs (M)
`rtv`	Retrieve individual parameters (C)
`svp`	Save parameters from current experiment (M)

rts — Retrieve shim coil settings (C)

Syntax: `rts(file)<:status>`

Description: Locates a preexisting file of shim settings and copies the settings into the current parameter set of the current experiment and sets `load='y'` to facilitate subsequent loading of shims with `su` (or related commands or macros). If the shim file is not found, `rts` displays the file names it tried.

The `rts` command returns shims from a `.fid` file or a `.par` file, selecting the shim parameters from the parameters stored there.

Arguments: `file` — the name of a file containing the shim coil settings to be retrieved. If the file name is an absolute path, `rts` uses it with no modifications. Otherwise, `rts` searches the applications directories.

`status` — the return variable with one of the following values after `rts` finishes searching for the shim coil settings file:

- 0 indicates that `rts` failed to find requested file.
- 1 indicates that `rts` found the requested file, either as an absolute path or in the `shims` directory of the first application directory.
- >=2 indicates that `rts` found the requested file in `shims` subdirectory of the second, third, or later application directory.

Examples:
```
rts('acetone')
rts('bb10mm'):r1
```

See also: *NMR Spectroscopy User Guide*

Related:

load	Load status of displayed shims (P)
su	Submit a setup experiment to acquisition (M)
svs	Save shim coil settings (C)

rttmp — Retrieve experiment data from experiment subfile (M)

Syntax: `rttmp(file)`

Description: Retrieves experiment data—parameters, FID, and transformed spectrum—from the file specified in a subdirectory inside `curexp+'/subexp'`.

Arguments: `file` is the name of the subfile from which to retrieve the experiment data.

Examples:
```
rttmp('H1')
rttmp('cosy')
```

See also: *NMR Spectroscopy User Guide*

Related:

captain	Copy experiment data into experiment subfile (M)
curexp	Current experiment directory (P)
svtmp	Move experiment data into experiment subfile (M)

rtv — Retrieve individual parameters (C)

Syntax:
```
rtv<(file,par1<,index1<,par2,index2...>>)><:val>
rtv('parmaster','noabort','parameter'):$pm
```

Description: Retrieves one or more parameters from a parameter file. The file might have been made with `svf` or `svp` or `sd` commands, or it might be from another experiment. If no return argument is added, the parameters are copied into the experiment's current tree. If the parameter does not already exist in the current tree, it is created. If the returned parameter is an array, the entire array is returned.

`rtv` returns values into the macro if a return argument is added. This form of `rtv` command, in which values are passed only to macro variables, avoids the creation of additional parameters in the experiment's current tree.

Arguments: `file` — name of the directory or a parameter file. If the supplied value for `file` is a directory (with or without the `.fid` or `.par` extension), the parameters are retrieved from the `procpar` file in that directory. If the supplied value does not correspond to a directory but rather is a parameter file, that file is used. The default is that `rtv` prompts for a file name. In that case, the file name can be given without single quotes.

`par1,index1,par2,index2,...` — name and array index of one or more parameters to be retrieved. The default for each array index argument is the first index. Including the array index for a parameter is only useful when returning values to the macro through a return argument.

`val` — return argument for values to return to the macro. If the requested parameter do not exist in the parameter file, `rtv` will abort.

`noabort` — keyword option must follow the `'parmaster'` keyword and precede the `parameter` argument. This option applies to a single parameter. Command does not abort if the requested parameter does not exist.

`parmaster` — filename of the parameter set.

`parameter` — the parameter name.

Executing `rtv` without macro return values causes the `fixpar` macro run. The macro `fixpar` is not executed if return values are requested. rtv will prompt

for a file name if the command is executed without an argument. The filename given in response to the prompt does not require single quotes.

In LC-NMR, `rt` will retrieve the `lcdata` (and `drunlog`) files if these files were saved along with the NMR data by using `svf`.

Examples:
```
rtv
rtv('/vnmr/parlib/cosy.par','phase')
rtv('/vnmr/parlib/cosy.par','noabort','phase')
```

See also: *NMR Spectroscopy User Guide* and *User Programming* manuals

Related:

`rt`	Retrieve FIDs (M)
`rtp`	Retrieve parameters (M)
`sd`	Set first decoupler frequency to cursor position (M)
`svf`	Save FIDs in current experiment (M)
`svp`	Save parameters from current experiment (M)

`rtx` Retrieve parameters based on rtx rules (C)

Syntax: `rtx(filename <,tree <, keyword1 <, keyword2 >>>)`

Description: The rtx command retrieves parameters from filename, based on the setting of the P_LOCK protection bit and using the rules below.

Arguments: `tree` is `'current'`, `'processed'`, `'global'`, or `'systemglobal'`.

`keyword1` may be `'keep'` or `'rt'`. The default is `'keep'`.

`keyword2` may be `'clear'` or `'noclear'`. The default is `'clear'`.

`keyword2` determines if the P_LOCK bit is cleared after `rtx` is executed.

Truth table for `rtx`.

Status of P_LOCK bit in current exp	*Status of P_LOCK bit in filename*	*keyword1*	*result*
on	on	keep or rt	do not rt
on	off	keep or rt	do not rt
off	on	keep or rt	do rt
off	off	keep	do not rt
off	off	rt	do rt
<no parameter>	on	keep or rt	do rt
<no parameter>	off	keep	do not rt
<no parameter>	off	rt	do rt

See also: *NMR Spectroscopy User Guide*

Related:

`execpars`	Set up the exec parameters (M)
`rtp`	**Retrieve parameters (M)**

S

s	Save display parameters as a set (M)
s(n)	Save display parameters (C)
s2pul	Set up parameters for standard two-pulse sequence (M)
sa	Stop acquisition (C)
sample	Submit change sample, Autoshim experiment to acquisition (M)
samplename	Sample name (P)
save	Save data (M)
savefile	Base file name for saving files (P)
saveglobal	Save selected parameters from global tree (P)
sb	Sinebell constant in directly detected dimension (P)
sb1	Sinebell constant in 1st indirectly detected dimension (P)
sb2	Sinebell constant in 2nd indirectly detected dimension (P)
sbs	Sinebell shift in directly detected dimension (P)
sbs1	Sinebell shift in 1st indirectly detected dimension (P)
sbs2	Sinebell shift in 2nd indirectly detected dimension (P)
sc	Start of chart (P)
sc2	Start of chart in second direction (P)
scalelimits	Set limits for scales in regression (M)
scalesw	Set scaling factor for multipulse experiments (M)
scalesw	Scale spectral width in directly detected dimension (P)
scalesw1	Set f_1 scaling factor for 2D multipulse experiments (M)
scalesw1	Scale spectral width in 1st indirectly detected dimension (P)
scalesw2	Scale spectral width in 2nd indirectly detected dimension (P)
sd	Set first decoupler frequency to cursor position (M)
sd2	Set second decoupler frequency to cursor position (M)
sd3	Set third decoupler frequency to cursor position (M)
sda	Set first decoupler frequency array (M)
sd2a	Set second decoupler frequency array (M)
sd3a	Set third decoupler frequency array (M)
sdp	Show diffusion projection (M)
sel1d	Apptype macro for Selective 1D experiments
select	Select spectrum, FID, trace, or 2D plane without display (C)
selex	Defines excitation band (M)
selexcit	Set up PFG selective excitation pulse sequence (M)
selexHT	Set up a selective Hadamard experiment (M)
send2vnmr	Send a command to VnmrJ (U)
seqfil	Pulse sequence name (P)
seqgen	Initiate compilation of user's pulse sequence (M,U)
serverport	Returns the VnmrJ network listening port value (C)
set2D	General setup for 2D experiments (M)
set2d	General setup for 2D experiments (M)
set3dproc	Set 3D processing (C)
setallshims	Set all shims into hardware (M)

S

setcolor	Set colors for graphics window and for plotters (C)
setdecpars	Set decoupler parameter values from probe file (M)
setdec2pars	Set decoupler 2 parameter values from probe file (M)
setdgroup	Set the Dgroup of a parameter in a tree (C)
setenumeral	Set values of a string parameter in a tree (C)
setether	Connect or reconnect host computer to Ethernet (U)
setexport	Set parameter bits for use with protocols (M)
setfrq	Set frequency of rf channels (C)
setgauss	Set a Gaussian fraction for lineshape (M)
setgcal	Set the gradient calibration constant (M)
setgcoil	Assign sysgcoil configuration parameter (M)
setgrid	Divide graphics window into rows and columns (C)
setgroup	Set group of a parameter in a tree (C)
sethtfrq1	Set a Hadamard frequency list from a line list ((M)
sethw	Set values for hardware in acquisition system (C)
setint	Set value of an integral (M)
setlimit	Set limits of a parameter in a tree (C)
setlk	Set up lock parameters (M)
setlockfreq	Set lock frequency (M)
setLP	Set up linear prediction in the direct dimension (M)
setLP1	Set F1 linear prediction parameters (M)
setlp0	Set parameters for zero linear phase (M)
setnoether	Disconnect host computer from Ethernet (U)
setoffset	Calculate offset frequency for given nucleus and ppm (M)
setparams	Write parameter to current probe file (M)
setpen	Set maximum number of HP plotter pens (M)
setplotdev	Return characteristics of a named plotter (C)
setpower	Set power and pulsewidth for a given γB1 value (M)
setprotect	Set protection mode of a parameter (C)
setrc	Set receiver constants (M)
setref	Set frequency referencing (M)
setref1	Set freq. referencing for 1st indirectly detected dimension (M)
setref2	Set freq. referencing for 2nd indirect detected dimension (M)
setscout	Set up a scout run (M)
setssfilter	Set sslsfrq to the frequencies of each suppressed solvents (M)
setsw	Set spectral width (M)
setsw1	Set spectral width in evolution dimension (M)
setsw2	Set spectral width in 2nd evolution dimension (M)
setselfrqc	Set selective frequency and width (M)
setselinv	Set up selective inversion (M)
settcldefault	Select default display templates for pulse sequence (M)
settune	Opens the Auto Tune Setup dialog (M)
settype	Change type of a parameter (C)
setup	Set up parameters for basic experiments (M)
setup_dosy	Set up gradient levels for DOSY experiments (M)
setvalue	Set value of any parameter in a tree (C)
setwave	Write a wave definition string into Pbox.inp file (M)

setwin	Activate selected window (C)
sf	Start of FID (P)
sf1	Start of interferogram in 1st indirectly detected dimension (P)
sf2	Start of interferogram in 2nd indirectly detected dimension (P)
sfrq	Transmitter frequency of observe nucleus (P)
sh2pul	Set up for a shaped observe excitation sequence (M)
shdec	Set up for shaped observe excitation sequence (M)
shell	Start a UNIX shell (C)
shelli	Start an interactive UNIX shell (C)
shim	Submit an Autoshim experiment to acquisition (C)
shimset	Type of shim set (P)
showconfig	Show system configuration settings (M)
showconsole	Show console configuration parameters (U)
showfit	Display numerical results of deconvolution (M)
showloginbox	Shows operator login dialog (M)
shownumx	x position counting from bottom left of every spectrum (P)
shownumy	y position counting from bottom left of every spectrum (P)
showoriginal	Restore first 2D spectrum in 3D DOSY experiment (M)
showplotter	Show list of currently defined plotters and printers (M)
showplotq	Display plot jobs in plot queue (M)
showprintq	Display print jobs in print queue (M)
showprotunegui	Show the graphical interface while tuning (P)
showrfmon	Show RF Monitor Button in Hardware Bar (P)
showstat	Display information about status of acquisition (M,U)
sin	Find sine value of an angle (C)
sine	Find values for a sine window function (M)
sinebell	Select default parameters for sinebell weighting (M)
sinesq	Find values for a sine-squared window function (M)
size	Returns the number of elements in an arrayed parameter (O)
slfreq	Measured line frequencies (P)
slw	Spin simulation linewidth (P)
smaxf	Maximum frequency of any transition (P)
sminf	Minimum frequency of any transition (P)
smsport	Sample Management System serial port connection (P)
sn	Signal-to-noise ratio (P)
solppm	Return ppm and peak width of solvent resonances (M)
solvent	Lock solvent (P)
solvinfo	Retrieve information from solvent table (C)
sort	Sort real values of a parameter (M)
sp	Start of plot in directly detected dimension (P)
sp1	Start of plot in 1st indirectly detected dimension (P)
sp2	Start of plot in 2nd indirectly detected dimension (P)
spadd	Add current spectrum to add/subtract experiment (C)
spcfrq	Display frequencies of rf channels (M)
specdc3d	3D spectral dc correction (P)
spin	Submit a spin setup experiment to acquisition (C)
spin	Sample spin rate (P)

S

spincad	Run SpinCAD program (C)
spingen	Compile SpinCAD pulse sequence *C)
spinll	Set up a slfreq array (M)
spinner	Open the Spinner Control window (C)
spins	Perform spin simulation calculation (C)
split	Split difference between two cursors (M)
spintype	Spinner Type ((P)
spmax	Take the maximum of two spectra (C)
spmin	Take minimum of two spectra in add/subtract experiment (C)
spsm	Enter spin system (M)
spsub	Subtract current spectrum from add/subtract experiment (C)
sqcosine	Set up unshifted cosine-squared window function (M)
sqdir	Study queue directory (P)
sqend	End a study queue (M)
sqexp	Load experiment from protocol (M)
sqfilemenu	Study queue file menu commands (M)
sqmode	Study queue mode (P)
sqname	Study queue parameter template (P)
sqpars	Create study queue parameters for imaging (M)
sqprotocol	Macro to create protocols (M)
sqreset	Reset study queue parameters for imaging (M)
sqrt	Return square root of a real number (O)
sqsavestudy	Macro to save study parameters for imaging (M)
sqsinebell	Set up unshifted sinebell-squared window function (M)
srate	Spinning rate for magic angle spinning (P)
sread	Read converted data into VnmrJ (C)
srof2	Calculate exact rof2 value for Cold Probes (M)
ss	Steady-state transients (P)
ssecho	Set up solid-state echo pulse sequence (M)
ssecho1	Set up parameters for SSECHO1 pulse sequence (M)
ssfilter	Full bandwidth of digital filter to yield a filtered FID (P)
sslsfrq	Center of solvent-suppressed region of spectrum (P)
ssntaps	Number of coefficients in digital filter (P)
ssorder	Order of polynomial to fit digitally filtered FID (P)
stack	Stacking mode for processing and plotting arrayed spectra (M)
stackmode	Stacking control for processing arrayed 1D spectra (P)
startq	Start a chained study queue (M)
status	Display status of sample changer (C,U)
std1d	Apptype macro for Standard 1D experiments (M)
stdshm	Interactively create a method string for autoshimming (M)
sth	Minimum intensity threshold (P)
string	Create a string variable (C)
strtext	Starting point for LP data extension in np dimension (P)
strtext1	Starting point for LP data extension in ni dimension (P)
strtext2	Starting point for LP data extension in ni2 dimension (P)
strtlp	Starting point for LP calculation in np dimension (P)
strtlp1	Starting point for LP calculation in ni dimension (P)

strtlp2	Starting point for LP calculation in ni2 dimension (P)
studyid	Study identification (P)
studypar	Study parameters (P)
studystatus	Study status (P)
studytime	Study time (P)
su	Submit a setup experiment to acquisition (M)
sub	Subtract current FID from add/subtract experiment (C)
substr	Select a substring from a string (C)
suselfrq	Select peak, continue selective excitation experiment (M)
svdat	Save data (C)
svf	Save FIDs in current experiment (M)
svfdf	Save FID data in FDF format (M)
svfdir	Directory for non-study data (P)
svfname	Filename parameter template for non-study data ((P)
Svfname	Create path for data storage (C)
svp	Save parameters from current experiment (M)
svs	Save shim coil settings (C)
svs	Spin simulation vertical scale (P)
svtmp	Move experiment data into experiment subfile (M)
sw	Spectral width in directly detected dimension (P)
sw1	Spectral width in 1st indirectly detected dimension (P)
sw2	Spectral width in 2nd indirectly detected dimension (P)
sw3	Spectral width in 3rd indirectly detected dimension (P)
sysgcoil	System gradient coil (P)
system	System type (P)
systemdir	VnmrJ system directory (P)

s — Save display parameters as a set (M)

Syntax: (1) `sset_number`
(2) `s(set_number)`

Description: Saves a copy of the current values of all display parameters. The set is data-independent because the parameters that govern a display (`sp`, `wp`, `vs`, etc.) are saved but no data is saved.

Arguments: `set_number` is number of the display parameter set to be saved.

Examples:
```
s2
s(3)
```

See also: *NMR Spectroscopy User Guide*

Related:

fr	Full recall of display parameter set (M)
r	Recall display parameter set (M)

s(n) — Save display parameters (C)

Applicability: All

Syntax: `s(n<,noupdate>)`

Description: Saves a copy of the current values of all display parameters as display parameter set `n` in the current experiment

`noupdate` as second argument prevents the automatic update of interactive programs.

Arguments: `n=1 to 9`

Related:
- `fr(n)` Recall all the parameters of the specified display parameter set (C)
- `r(n)` Recalls limited number of display parameters)

`s2pul` Set up parameters for standard two-pulse sequence (M)

Description: Converts the current experiment to an experiment suitable for the standard two-pulse sequence (S2PUL).

See also: *NMR Spectroscopy User Guide*

`sa` Stop acquisition (C)

Syntax: `sa<(option|number)>`

Description: Stops an experiment that has been submitted to acquisition. If experiment is active, it is stopped. Data is retained. `sa` applies to the experiment that you are joined to at the time the `sa` command is entered. Thus, if experiment 1 is active, you must be joined to experiment 1 for `sa` to stop that acquisition. If you are in experiment 2, entering `sa` has no effect on experiment 1.

When experiments are queued, the behavior of `sa` is more complex. If an experiment is active in `exp1` and queued in `exp2`, entering `sa` from `exp1` stops that experiment and immediately begins acquisition on `exp2`. Entering `sa` from `exp2`, on the other hand, removes `exp2` from the queue, without affecting the active experiment 1.

Entering `sa` from an experiment that is not active or queued has no effect.

Arguments: `option` is one of the following:

- `'eos'`, `'ct'`, `'scan'` are keywords to stop at the next `ct`.
- `'eob'`, `'bs'` are keywords to stop at the next block size.
- `'eof'`, `'nt'`, `'fid'` are keywords to stop at the next complete FID.
- `'eoc'`, `'il'` are keywords to stop at next complete `il` cycle (i.e., the latest block size that has been completed for all FIDs in interleave cycle.

`number` is an integer number to stop at the next `ct`, where the value of `ct` is a multiple of `number`. This is useful when you want to complete a phasecycle before stopping.

Examples:
```
sa
sa('ct')
sa(4)
```

See also: *NMR Spectroscopy User Guide*

Related:
- `bs` Block size (P)
- `ct` Completed transients (P)
- `il` Interleave arrayed and 2D experiments (P)
- `nt` Number of transients (P)
- `ra` Resume acquisition stopped with *sa* command (C)

`sample` Submit change sample, Autoshim experiment to acquisition (M)

Applicability: Systems with a sample changer.

Description: Performs the combined operations `change`, `spin`, `lock`, and `shim`, making it a convenient setup command for a new sample.

See also: *NMR Spectroscopy User Guide*

Related:

au	Submit experiment to acquisition and process data (C)
change	Submit a change sample experiment to acquisition (M)
ga	Submit experiment to acquisition and FT the result (C)
go	Submit experiment to acquisition (C)
lock	Submit an Autolock experiment to acquisition (C)
shim	Submit an Autoshim experiment to acquisition (C)
spin	Submit a spin setup experiment to acquisition (C)
su	Submit a setup experiment to acquisition (M)

samplename — Sample name (P)

Description: Specifies the name of the sample. It is saved with a liquids study.

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:

cqsavestudy	Macro to save study queue parameters (M)
notebook	Notebook name (P)
page	Name of page (P)
studypar	Study parameters (P)

save — Save data (M)

Description: Macro to save data. In a study, it uses sqdir and autoname to construct the data filename. If not in a study, it uses svfdir and svfname to construct the data filename.

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:

acquire	Acquire data (M)
autoname	Create path for data storage (C)
autoname	Prefix for automation data file (P)
sqdir	Study queue directory (P)
svfdir	Directory for non-study data (P)
Svfname	Create path for data storage (C)
svfname	Filename parameter template for non-study data ((P)

savefile — Base file name for saving files (P)

Applicability: Systems with LC-NMR accessory.

Description: Contains the base file name using the format savefile.001, savefile.002, etc., to which a series of FIDs or data sets are saved. If savefile does not exist, the parlc macro can create it.

See also: *NMR Spectroscopy User Guide*

Related:

parlc	Create LC-NMR parameters (M)

saveglobal — Save selected parameters from global tree (P)

Description: Saves an array of parameter names from the global or systemglobal tree. Whenever go is executed, the parameters listed are saved in the current tree with an underscore (_) appended. These parameters are copied back into the global tree (without the underscore) whenever processing by wbs, wnt, wexp, or werr occurs.

See also: *NMR Spectroscopy User Guide*

Related:

go	Submit experiment to acquisition (C)
loc	Location of sample in tray (P)

S

sb — Sinebell constant in directly detected dimension (P)

Description: Applies a sinebell constant along the directly detected dimension. This dimension is often referred to as the f_2 dimension in 2D data sets, the f_3 dimension in 3D data sets, etc.

Values: A positive value applies a sinebell of the form $\sin\left(\frac{t \cdot \pi}{2 \cdot sb}\right)$

A negative value applies a squared sinebell function of form $\sin^2\left(\frac{t \cdot \pi}{2 \cdot sb}\right)$

sb is given in seconds. Typical value is sb='n'.

See also: *NMR Spectroscopy User Guide*

Related:

sb1	Sinebell constant in 1st indirectly detected dimension (P
sb2	Sinebell constant in 2nd indirectly detected dimension (P)
sbs	Sinebell shift constant in directly detected dimension (P)
sine	Find values for a sine window function (M)
sinebell	Select default parameters for sinebell weighting (M)
sinesq	Find values for a sine squared window function (M)

sb1 — Sinebell constant in 1st indirectly detected dimension (P)

Description: Applies a sinebell constant along the first indirectly detected dimension. This dimension is often referred to as the f_1 dimension in multidimensional data sets. sb1 works analogously to the parameter sb. The "conventional" parameters, such as lb and gf, operate on the detected FIDs, while this "2D" parameter is used during processing of the interferograms.

Values: A positive value applies a sinebell of the form $\sin\left(\frac{t \cdot \pi}{2 \cdot sb1}\right)$

A negative value applies a squared sinebell function of form $\sin^2\left(\frac{t \cdot \pi}{2 \cdot sb1}\right)$

sb1 is given in seconds. Typical value is sb1='n'.

See also: *NMR Spectroscopy User Guide*

Related:

sb	Sinebell constant in the directly detected dimension (P)
sb2	Sinebell constant in 2nd indirectly detected dimension (P)

sb2 — Sinebell constant in 2nd indirectly detected dimension (P)

Description: Applies a sinebell constant along the second indirectly detected dimension. This dimension is often referred to as the f_2 dimension in multidimensional data sets. sb2 works analogously to the parameter sb. The value of sb2 can be set with wti on the 2D interferogram data.

Values: A positive value applies a sinebell of the form $\sin\left(\frac{t \cdot \pi}{2 \cdot sb2}\right)$

A negative value applies a squared sinebell function of form $\sin^2\left(\frac{t \cdot \pi}{2 \cdot sb2}\right)$

sb2 is given in seconds. Typical value is sb2='n'.

See also: *NMR Spectroscopy User Guide*

Related:

sb	Sinebell constant in directly detected dimension (P)
sb1	Sinebell constant in 1st indirectly detected dimension (P)
wti	Interactive weighting (C)

sbs — Sinebell shift in directly detected dimension (P)

Description: Working in combination with the parameter sb, sbs allows shifting the origin of the sinebell function along the directly detected dimension. This dimension is often referred to as the f_2 dimension in 2D data sets, the f_3 dimension in 3D data sets, etc.

Values: The origin is shifted according to the formula $\sin\left(\frac{(t - sbs) \cdot \pi}{2 \cdot sb}\right)$

The square of this function is applied if sb is negative. sbs is given in seconds. The typical value is sbs='n'.

See also: *NMR Spectroscopy User Guide*

Related:

sb	Sinebell constant in directly detected dimension (P)
sbs1	Sinebell shift in 1st indirectly detected dimension (P)
sbs2	Sinebell shift in 2nd indirectly detected dimension (P)
sine	Find values for a sine window function (M)
sinesq	Find values for a sine squared window function (M)

sbs1 Sinebell shift in 1st indirectly detected dimension (P)

Description: Working in combination with the parameter sb1, sbs1 allows shifting the origin of the sinebell function along the first indirectly detected dimension. This dimension is often referred to as the f_1 dimension in multidimensional data sets. sbs1 works analogously to parameter sbs. The "conventional" parameters, such as lb and gf, operate on the detected FIDs, while this "2D" parameter is used during processing of the interferograms.

Values: The origin is shifted according to the form $\mathtt{sin}\left(\frac{(t-\mathtt{sbs1})\cdot\pi}{2\cdot\mathtt{sb1}}\right)$

The square of this function is applied if sb1 is negative. sbs1 is given in seconds. The typical value is sbs1='n'.

See also: *NMR Spectroscopy User Guide*

Related:

sb1	Sinebell constant in 1st indirectly detected dimension (P)
sbs	Sinebell shift constant in directly detected dimension (P)
sb2	Sinebell constant in 2nd indirectly detected dimension (P)

sbs2 Sinebell shift in 2nd indirectly detected dimension (P)

Description: Working in combination with the parameter sb2, sbs2 allows shifting the origin of the sinebell function along the second indirectly detected dimension. This dimension is often referred to as the f_2 dimension in multidimensional data sets. sbs2 works analogously to parameter sbs. sbs2 can be set with wti on the 2D interferogram data.

Values: The origin is shifted according to the formula $\mathtt{sin}\left(\frac{(t-\mathtt{sbs2})\cdot\pi}{2\cdot\mathtt{sb2}}\right)$

The square of this function is applied if sb2 is negative. sbs2 is given in seconds. The typical value is sbs2='n'.

See also: *NMR Spectroscopy User Guide*

Related:

sbs	Sinebell shift constant in directly detected dimension (P)
sb2	Sinebell constant in 2nd indirectly detected dimension (P)
wti	Interactive weighting (C)

sc Start of chart (P)

Description: Positions of the start of the plotting position (the "chart") with respect to the right edge of the plotter.

Values: 0 to wcmax, in mm

See also: *NMR Spectroscopy User Guide*

Related:

sc2	Start of chart in second direction (P)
wc	Width of chart (P)
wcmax	Maximum width of chart (P)

S

sc2 — Start of chart in second direction (P)

Description: Controls the start of plotting position of the second axis (or *y* axis) of a 2D contour plot. The parameter wc2 controls the width of the chart.

Values: 0 to wc2max, in mm.

See also: *NMR Spectroscopy User Guide*

Related:

sc	Start of chart (P
wc2	Width of chart in second direction (P)
wc2max	Maximum width of chart in second direction (P)

scalelimits — Set limits for scales in regression (M)

Syntax: scalelimits(x_start,x_end,y_start,y_end)

Description: Causes the command expl, which is used by regression to display data, to use typed-in scale limits. The limits are retained as long as an expl display is retained.

Arguments: x_start,x_end,y_start,y_end are *x*-axis and *y*-axis starting and ending limits. The default is that scalelimits prompts for the limits.

See also: *NMR Spectroscopy User Guide, User Programming*

Related:

autoscale	Resume autoscaling after limits set by scalelimits (M)
expl	Display exponential or polynomial curves (C)

scalesw — Set scaling factor for multipulse experiments (M)

Description: Sets the spectral width scaling factor for the multipulse sequences set up by macros br24 and mrev8. The value of the scaling factor is stored in the parameter scalesw.

See also: *User Guide: solid-State NMR*

Related:

br24	Set up BR24 multiple pulse experiment (M)
mrev8	Set up MREV8 multiple pulse experiment (M)
scalesw	Scale spectral width in directly detected dimension (P)
scalesw1	Set f_1 scaling factor for 2D multipulse experiments (M)

scalesw — Scale spectral width in directly detected dimension (P)

Description: Adjusts the frequency scale dimension used with the parameter sets in the sequences set up by the br24, mrev8, ssecho, and xpolar1 macros. If scalesw is active, the labels for the frequency scales includes the letters sc in parentheses. A scaled frequency can be referenced using the rl macro.

Values: 'n', number greater than 0.0

See also: *User Guide: Solid-State NMR*

Related:

br24	Set up BR24 multiple pulse experiment (M)
mrev8	Set up MREV8 multiple pulse experiment (M)
rl	Set reference line (M)
scalesw	Set scaling factor for multipulse experiments (M)
scalesw1	Scale spectral width in 1st indirectly detected dimension (P)
scalesw2	Scale spectral width in 2nd indirectly detected dimension (P)
ssecho	Set up solid-state echo pulse sequence (M)
xpolar1	Set up parameters for XPOLAR1 pulse sequence (M)

scalesw1 — Set f_1 scaling factor for 2D multipulse experiments (M)

Description: Sets the f_1 spectral width scaling factor for the multipulse sequences set up by the br24 and mrev8 macros. The value of the scaling factor is stored in the parameter scalesw1.

See also: *User Guide: Solid-State NMR*

Related:

br24	Set up BR-24 multiple pulse experiment (M)
mrev8	Set up MREV8 multiple pulse experiment (M)
scalesw1	Scale spectral width in 1st indirectly detected dimension (P)

scalesw1 — Scale spectral width in 1st indirectly detected dimension (P)

Description: Analogous to the scalesw parameter except that scalesw1 applies to first indirectly detected dimension of a multidimensional data set. A scaled frequency along this dimension can be referenced using the rl1 macro.

Values: 'n', number greater than 0.0

See also: *User Guide: Solid-State NMR*

Related:

rl1	Set reference line in 1st indirectly detected dimension (M)
scalesw	Scale spectral width in directly detected dimension (P)
scalesw1	Set f_1 scaling factor for 2D multipulse experiments (M)
scalesw2	Scale spectral width in 2nd indirectly detected dimension (P)

scalesw2 — Scale spectral width in 2nd indirectly detected dimension (P)

Description: Analogous to the scalesw parameter except scalesw2 applies to second indirectly detected dimension of a multidimensional data set. A scaled frequency along this dimension can be referenced using the rl2 macro.

Values: 'n', number greater than 0.0

See also: *User Guide: Solid-State NMR*

Related:

rl2	Set reference line in 2nd indirectly detected dimension (M)
scalesw	Set scaling factor for multipulse experiments (M)
scalesw1	Set f_1 scaling factor for 2D multipulse experiments (M)

sd — Set first decoupler frequency to cursor position (M)

Description: Sets the first decoupler frequency offset parameter dof to place the first decoupler at the cursor position in the spectrum. This works only if the transmitter nucleus and first decoupler nucleus are the same (tn=dn).

See also: *NMR Spectroscopy User Guide*

Related:

dof	Frequency offset for first decoupler (P)
dn	Nucleus of first decoupler (P)
sd2	Set second decoupler frequency to cursor position (M)
sd3	Set third decoupler frequency to cursor position (M)
sda	Set first decoupler frequency array (M)
tn	Nucleus for observe transmitter (P)

sd2 — Set second decoupler frequency to cursor position (M)

Applicability: Systems with a second decoupler.

Description: Sets the second decouple frequency offset parameter dof2 to place the second decoupler at the cursor position in the spectrum. This works only if the transmitter nucleus and second decoupler nucleus are the same (tn=dn2).

See also: *NMR Spectroscopy User Guide*

Related:		
	dn2	Nucleus for second decoupler (P)
	dof2	Frequency offset for second decoupler (P)
	sd	Set first decoupler frequency to cursor position (M)
	sd2a	Set second decoupler frequency array (M)
	tn	Nucleus for observe transmitter (P)

sd3 Set third decoupler frequency to cursor position (M)

Applicability: Systems with a third decoupler.

Description: Sets the third decoupler frequency offset parameter dof3 to place the third decoupler at the cursor position in the spectrum. This works only if the transmitter nucleus and third decoupler nucleus are the same (tn=dn3).

See also: *NMR Spectroscopy User Guide*

Related:		
	dn3	Nucleus for third decoupler (P)
	dof3	Frequency offset for third decoupler (P)
	sd	Set first decoupler frequency to cursor position (M)
	sd3a	Set third decoupler frequency array (M)
	tn	Nucleus for observe transmitter (P)

sda Set first decoupler frequency array (M)

Description: Sets up an array of offset values for the first decoupler, using sd for the first decoupler position and sda for subsequent positions. This works only if the transmitter nucleus and first decoupler nucleus are the same (tn=dn).

See also: *NMR Spectroscopy User Guide*

Related:		
	dn	Nucleus for first decoupler (P)
	sd	Set first decoupler frequency to cursor position (M)
	sd2a	Set frequency array for second decoupler (M)
	sd3a	Set frequency array for third decoupler (M)
	tn	Nucleus for observe transmitter (P)

sd2a Set second decoupler frequency array (M)

Applicability: Systems with a second decoupler.

Description: Sets up an array of offset values for the second decoupler, using sd2 for the first position and sd2a for subsequent positions. This works only if the transmitter nucleus and second decoupler nucleus are the same (tn=dn2).

See also: *NMR Spectroscopy User Guide*

Related:		
	dn2	Nucleus for second decoupler (P)
	sd2	Set second decoupler frequency to cursor position (M)
	sda	Set first decoupler frequency array (M)
	tn	Nucleus for observe transmitter (P)

sd3a Set third decoupler frequency array (M)

Applicability: Systems with a third decoupler.

Description: Sets up an array of offset values for the third decoupler, using sd3 for the first position and sd3a for subsequent positions. This works only if the transmitter nucleus and third decoupler nucleus are the same (tn=dn3).

See also: *NMR Spectroscopy User Guide*

Related:

dn2	Nucleus for third decoupler (P)
sd3	Set third decoupler frequency to cursor position (M)
sda	Set first decoupler frequency array (M)
tn	Nucleus for observe transmitter (P)

sdp — Show diffusion projection (M)

Description: Displays projection onto diffusion axis using the dsp facility. Use with 2D or 3D DOSY data after DOSY analysis. The unit of the resulting axis is D (10^{-10} m^2/sec). Because sdp overwrites the parameters in the current experiment, use it in only an experiment in which it is okay for existing data to be overwritten.

See also: *NMR Spectroscopy User Guide*

Related:

dosy	Process DOSY experiments (M)

sel1d — Apptype macro for Selective 1D experiments (M)

Description: Perform the actions for Selective 1D protocols to set up, process, and plot experiments.

Examples:
`sel1d('setup')` – execute sel1d experimental setup
`sel1d('process')` – execute sel1d processing
`sel1d('plot')` – execute sel1d plotting

Related:

apptype	Application type (p)
execpars	Set up the exec parameters (M)

select — Select spectrum, FID, trace, or 2D plane without display (C)

Syntax:
(1) `select<('next'|'prev'|selection)><:index>`
(2) `select<(<'f1f3'|'f2f3'|'f1f2'><,'proj'>`
`<,'next'|'prev'|plane>)><:index>`

Description: Directs future actions to apply to a particular spectrum or FID in a 1D array, to a trace in 2D (syntax 1), or to a particular 2D plane from a 3D data set (syntax 2). If select is called with no arguments, it returns the current index. When VnmrJ is first booted up, select is in 1D mode. select enters the 2D mode if any of the keywords 'f1f3', 'f2f3', 'f1f2', or 'proj' are present in the argument list. Entering the ds and jexp commands set select back in the 1D mode.

Arguments: For 1D operations (syntax 1):

- 'next' is keyword to increment by 1 the 1D spectrum or trace index.
- 'prev' is keyword to decrement by 1 the 1D spectrum or trace index.
- selection is a number selecting a 1D spectrum, FID, or trace.
- index returns the number of the current 1D spectrum, FID, or trace.

For selecting various 2D planes of a 3D data set (syntax 2):

- 'f1f3', 'f2f3', and 'f1f2' are types of 2D planes. The parameters plane and index2 serve to indicate the exact 2D plane that is currently viewable by VnmrJ. Note that index2 cannot be entered from the keyboard (i.e., you cannot select a new 2D plane by changing the value of index2); you must use the select command instead.
- 'proj' is keyword to use the 2D projection whose plane type is determined by the parameter plane.

- 'next' is keyword to increment the parameter index2 to its next value and sets up VnmrJ to be ready to display the 2D plane whose number is the new index2 value.
- 'prev' performs analogously except that index2 is decremented.
- plane is a number selecting the plane.
- index returns the number of the current plane.

Examples:
```
select('next')
select(2):r1
select('f1f3')
```

See also: *NMR Spectroscopy User Guide*, *User Programming*

Related:

arraydim	Dimension of experiment (P)
ds	Display a spectrum (C)
index2	Projection or 3D plane index selected (P)
jexp	Join existing experiment (C)
plane	Currently displayed 3D plane type (P)

selex — Defines excitation band (M)

Syntax: `selex<(sh<,pw<,st<,ph<,fla<,trev>>>>>)>`

Description: Defines the excitation band from the position of cursors in the graphics window and reports them to user. It also sets r1 to excitation bandwidth and r2 to offset. selex is part of the Pbox software environment and uses the Pbox macros pbox_bw and putwave.

Arguments:

sh is the name of a shape file.

pw is the pulsewidth, in sec.

st is the spin status: 0 for excitation, 0.5 for refocusing, or 1 for de-excitation.

ph is the phase (or phase cycle, see wavelib/supercycles).

fla is the flip angle.

trev is the time reversal. This argument can be used to cancel time reversal introduced by setting the spin status (st) to 1 for de-excitation.

Examples:
```
selex
selex('esnob',0.0,1,90.0)
```

See also: *NMR Spectroscopy User Guide*

Related:

Pbox	Pulse shaping software (U)

selexcit — Set up PFG selective excitation pulse sequence (M)

Applicability: Systems with a pulsed field gradient module.

Description: Prepares an experiment for PFG (pulsed field gradient) selective excitation, with presaturation option.

See also: *NMR Spectroscopy User Guide*

selexHT — Set up a selective Hadamard experiment (M)

Description: Sets up parameters for a selective shaped pulse Hadamard-encoded test experiment.

See also: *NMR Spectroscopy User Guide*

Related:

htofs1	Hadamard offset in ni (P)
fn1	Fourier number in 1st indirectly detected dimension (P)

	ni	Number of increments in 1st indirectly detected dimension (P)
	ft2d	Fourier transform 2D data (C)
	sethtfrq1	Set Hadamard frequency list from a line list (M)

send2vnmr — Send a command to VnmrJ (U)

Syntax: `send2Vnmr $vnmruser/.talk command`

Description: Sends a command from UNIX to VnmrJ using the port number stored in the `$vnmruser/.talk` file. This file is created when the macro `listenon` is entered on the VnmrJ command line.

Arguments: `command` is any character string (commands, macros, or if statements) normally typed into the VnmrJ command line.

Examples: `send2Vnmr $vnmruser/.talk dg`

See also: *User Programming*

Related:	bootup	Macro executed automatically when VnmrJ activated (M)
	listenon	Enable receipt of messages from `send2Vnmr` (M)
	listenoff	Disable receipt of messages from `send2Vnmr` (M)

seqfil — Pulse sequence name (P)

Description: Identifies the name of the pulse sequence to be used. The value of `seqfil` is displayed on the top line of the screen after the "`Seq:`" label. Macros used to set up new pulse sequences, such as `Dept` and `Apt`, automatically change the `seqfil` parameter.

See also: *NMR Spectroscopy User Guide*

Related:	pslabel	Pulse sequence label (P)

seqgen — Initiate compilation of user's pulse sequence (M,U)

Syntax: (From VnmrJ) `seqgen(<-static,>file<.c>)`
(From UNIX) `seqgen <-static> file<.c> <file1,...>`

Description: Begins compilation of a user pulse sequence. When used from VnmrJ, the macro `seqgen` calls the UNIX shellscript `seqgen`, which can also be called directly from UNIX, as shown above. The `seqgen` shellscript then calls the compilation makefile `seqgenmake`, located in the directory `/vnmr/acqbin`.

The specified pulse sequence can be located in `~/vnmrsys/psglib` or in `/vnmr/psglib`. If two files with the same name exist in these two directories, the local directory (`~/vnmrsys/psglib`) takes precedence. For sequences in `/vnmr/psglib`, `seqgen` first copies the file into the local directory `~/vnmrsys/psglib` and then compiles it there; the resulting executable is then placed in `~/vnmrsys/seqlib`. A copy of the pulse sequence is also copied into the `seqlib` directory along with the executable. As it is running, `seqgen` reports where it found the specified sequence(s).

`seqgen` uses library files (object modules) found in `/vnmr/lib`. If `setuserpsg` and `psggen` has been run, the library files in the local directory `~/vnmrsys/psg` take precedence of those in `/vnmr/lib`.

Error messages are written into the file `file.errors`, where `file` is the name of the pulse sequence in `psglib` in which compilation is performed.

Note that `seqgen` not only accepts file names with and without extensions, but also accepts files specified with wildcards and complex paths (`seqgen` strips the directory part, and `seqgen /vnmr/psglib/apt` will compile `~/vnmrsys/psglib/atp.c` if it exists).

Arguments: `-static` is a keyword for `seqgen` to use static rather than dynamic binding. Static binding results in larger executables in `seqlib` (several hundred Kbytes), but these sequences execute slightly faster (i.e., the `go` command). While insignificant generally, faster execution is helpful in some special applications such as the Scout Scan™ mode of LC-NMR, where the time spent on the `go` command becomes critical. Static binding results in a fixed-size time gain, regardless of the number of increments; for large multidimensional experiments, the speed difference is not noticeable.

`file` is the file name of a standard two-pulse sequence.

`.c` is the extension on the file name.

`file1,file2,...` are the names of files containing more sequences.

Examples: (From VnmrJ) `seqgen('/vnmr/psglib/*.c')`
(From UNIX) `seqgen /vnmr/psglib/*.c`
(From UNIX) `seqgen apt dept noesy`
(From UNIX) `seqgen -static lc1d`

See also: *User Programming*

serverport — Returns the VnmrJ network listening port value (C)

Applicability: VnmrJ

Syntax: `serverport`

Description: The serverport command returns the port number when VnmrJ opens a network port (socket) for other programs to send it network messages. See the `write('net',...)` command for an example on how to use this port number.

Related:		
	`write`	Write formatted text to a device (C)

set2D — General setup for 2D experiments (M)

Syntax: `set2D<(F2_dig_res<,F1_dig_res>)>`

Description: Similar to `set2d` but does not execute `par2d` and does not make `sw1`, `rfl1`, and `rfp1` decisions based on `tn`=`dn` condition.

Arguments: `F2_dig_res` is the f_2 digital resolution desired, in Hz/pt. Default is 6.

`F1_dig_res` is the f_1 digital resolution desired, in Hz/pt. Default is 12.

Related:		
	`rfl1`	Reference peak position in 1st indirectly detected dimension (P)
	`rfp1`	Reference peak frequency in 1st indirectly detected dimension (P)
	`set2d`	General setup for 2D experiments (M)
	`sw1`	Spectral width in 1st indirectly detected dimension (P)

set2d — General setup for 2D experiments (M)

Syntax: `set2d(experiment<,F2_dig_res<,F1_dig_res>>)`

Description: Runs the macro `par2d` to create new parameters needed for 2D experiments, then selects starting values for a number of parameters. The `set2d` macro is “internal” and not normally typed directly by the user.

Arguments: `experiment` is the name of a 2D experiment (e.g., `'noesy'`).

`F2_dig_res` is the f_2 digital resolution desired, in Hz/pt.

`F1_dig_res` is the f_1 digital resolution desired, in Hz/pt.

Examples:
```
set2d('cosyps')
set2d('hetcor',16)
set2d('het2dj',16,(2*sw1)/fn1)
```

See also: *NMR Spectroscopy User Guide*

Related:

par2d	Create 2D acquisition parameters (M)

set3dproc — Set 3D processing (C)

Syntax: `set3dproc<('nocoef'><,directory>)>`

Description: Creates the file `procdat` that contains binary 3D information used by `ft3d` in processing the 3D FID data. It also creates the 3D parameter set `procpar3d` that is used by the `select` command to display the 2D planes from the 3D transformed data. `set3dproc` can only create the proper 3D coefficient file if the parameters `phase` and `phase2` are used to generate States-Haberkorn (hypercomplex) or TPPI data along the t_1 and t_2 dimensions.

`set3dproc` creates the coefficient file for the following five values of `array` (where SH is States-Haberkorn):

- if `array=''` (null string), type of 3D data is TPPI(t_1) – TPPI(t_2)
- if `array='phase'`, type of 3D data is SH(t_1) – TPPI(t_2)
- if `array='phase2'`, type of 3D data is SH(t_2) – TPPI(t_1)
- if `array='phase2,phase'`, type of 3D data is SH(t_1) – SH(t_2)

If `array` is set to some other value, `set3dproc` cannot create the 3D coefficient file and an error is reported within VnmrJ.

Arguments: `'nocoef'` is a keyword that the 3D coefficient file `coef` is not to be created.

`directory` is the name of the directory for `procdat` and `procpar3d`. The default is the subdirectory `info` in the directory `curexp`.

Examples:
```
set3dproc
set3dproc('nocoef','curexp/info3d')
```

See also: *NMR Spectroscopy User Guide*

Related:

array	Parameter order and precedence (P)
ft3d	Perform a 3D Fourier transform (M,U)
phase	Phase selection (P)
phase2	Phase selection for 3D acquisition (P)
select	Select a spectrum or 2D plane without displaying it (C)
wftt3	Process f_3 dimension during 3D acquisition (M)

setallshims — Set all shims into hardware (M)

Description: Sets shims from the current parameter tree into hardware. `setallshims` is equivalent to entering `load='y'su` but without setting all the hardware parameters normally set by `su` (temperature, decoupling, transmitter initialization, etc.). The shims used depend on the `shimset` configuration. For the shim set on the Ultra•nmr shim system, `setallshims` is active only if hardware-to-software shim communication is enabled.

See also: *NMR Spectroscopy User Guide*

Related:

load	Load status of displayed shims (P)
readallshims	Read all shims from hardware (M)
readhw	Read current values of acquisition hardware (C)
sethw	Set values for hardware in acquisition system (C)

shimset	Type of shim set (P)
su	Submit a setup experiment to acquisition (M)

setcolor — Set colors for graphics window and for plotters (C)

Syntax:
(1) `setcolor('pcl',item_index,'color')`
(2) `setcolor('hpgl',item_index,'color')`
(3) `setcolor('pen',pen_number,'color')`
(4) `setcolor('graphics',item_index,red,green,blue)`
(5) `setcolor('ps',item_index,red,green,blue)`
(6) `setcolor('plotter',black_plane,color_planes)`

Description: Sets colors used on the graphics window and on plotters. This command is a utility program used by the `color` macro and other macros. It is not expected that `setcolor` would be entered directly from the input window.

Arguments: `'pcl'` is a keyword to set colors on a plotter device that uses the PCL language. PCL plotters are the laser type of plotter.

`'hpgl'` is a keyword to set colors on a plotter device that uses the HPGL language. HPGL plotters are the pen type of plotter.

`'pen'` is a keyword that next two arguments set the color for a physical pen on a plotter device that uses the HPGL language.

`'graphics'` is a keyword to set colors on the graphics window.

`'ps'` is a keyword to set colors on a plotter using the PostScript language.

`red`, `green`, `blue` are three integers between `0` and `255` that set the amount of red, green, and blue color on the graphics window or PostScript plotter.

`'plotter'` is a keyword that the next two arguments set the black mode and number of colors available for a plotter device.

`item_index` is an index number from the following list that represents a specific drawing item.

8	background of images
9	real channel of an FID
10	imaginary channel of an FID
11	spectrum
12	integral
13	parameters
14	scale
15	threshold line (graphics device only)
16	second spectrum or FID in `addi` (graphics device only)
17	result spectrum or FID in `addi` (graphics device only)
18	cursors (graphics device only)
19	foreground of images
20	background color of graphics window (graphics device only)
20-35	contour 0 to contour 15 of absolute value 2D display
36-42	contours –7 to –1 of phased 2D display
44-50	contours 1 to 7 of phased 2D display

`pen_number` is an integer from `1` to `8` that specifies the physical pen used.

`color` is a string for the color set for the device: `'red'`, `'green'`, `'blue'`, `'cyan'`, `'magenta'`, `'yellow'`, `'white'`, or `'black'`.

`black_plane` is 1 or 0, specifying whether the plotter has a separate black mode. Because all currently supported plotters have this feature, the value is usually 1.

`color_planes` specifies how many colors are available. Use 3 for color plotters and `0` for black and white plotters.

Examples:
```
setcolor('pcl',11,'green')
setcolor('hpgl',11,'red')
setcolor('pen',2,'red')
setcolor('graphics',11,255,0,0)
setcolor('ps',11,255,255,0)
setcolor('plotter',1,0)
```

See also: *NMR Spectroscopy User Guide*

Related:
- `addi` Start interactive add/subtract mode (C)
- `color` Select plotting colors from a graphical interface (M)

`setdecpars` Set decoupler parameter values from probe file (M)

Syntax: `setdecpars`

Description: Reads from the probe file `pwxlvl`, `pwx`, `pplvl`, `pp`, `dpwr`, `dmf`, `dmm`, `dres`, and `dseq` values, if they exist, and updates the current experiment parameters.

Related:
- `setdec2pars` Set decoupler 2 parameter values from probe file (M)

`setdec2pars` Set decoupler 2 parameter values from probe file (M)

Syntax: `setdec2pars`

Description: Reads from the probe file `pwx2lvl`, `pwx2`, `dpwr2`, `dmf2`, `dmm2`, `dres2`, and `dseq2` values, if they exist, and updates the current experiment parameters.

Related:
- `setdecpars` Set decoupler parameter values from probe file (M)

`setdgroup` Set the Dgroup of a parameter in a tree (C)

Syntax: `setdgroup(parameter,dgroup<,tree>)`

Description: Sets the Dgroup of a parameter in a tree. The application determines the usage of `setdgroup`. Only Tcl-dg currently uses this feature.

Arguments:
`parameter` is the name of the parameter.

`dgroup` is an integer.

`tree` is `'current'`, `'global'`, `'processed'`, or `'systemglobal'`. The default is `'current'`. Refer to the description of the `create` command for more information on types of trees.

Examples:
```
setdgroup('a',1)
setdgroup('b',3,'global')
```

See also: *User Programming*

Related:
- `create` Create new parameter in a parameter tree (C)

`setenumeral` Set values of a string parameter in a tree (C)

Syntax: `setenumeral(parameter,N,enum1,enum2,...,enumN<,tree>)`

Description: Sets the possible values of a string parameter in a parameter tree. To remove enumerated values from a parameter, set argument `N` to `0` (see example below).

Arguments: `parameter` is the name of the parameter.

`N` is the number of enumeral values to be assigned to `parameter` (or removed from `parameter` if `N` is set to `0`).

`enum1` to `enumN` are the possible string values of the parameter.

`tree` is `'current'`, `'global'`, `'processed'`, or `'systemglobal'`. The default is `'current'`. Refer to the description of the `create` command for more information on types of trees.

Examples:
```
setenumeral('size',0)
setenumeral('size',2,'large','small')
setenumeral('user',3,'user','superuser','master',
   'global')
```

See also: *User Programming*

Related: `create` Create new parameter in a parameter tree (C)

setether — Connect or reconnect host computer to Ethernet (U)

Description: Connects or reconnects the host computer to the Ethernet network. Only `root` can execute this shellscript properly. If the system is already connected to the Ethernet network, `setether` does nothing.

On systems running Solaris, `setether` undoes the work of `setnoether`. You cannot use `setether` unless you previously entered the `setnoether` command. `setether` restores the files `hostname.le0`, `defaultdomain`, and `defaultrouter` so that Ethernet is activated on the host computer when UNIX is rebooted.

See also: *VnmrJ Installation and Administration*

Related: `setnoether` Disconnect host computer from Ethernet (U)

setexport — Set parameter bits for use with protocols (M)

Description: Set the parameter protection bits for use with the rtx command. Usually called by other macros, and not used from the command line.

Related: `rtx`
`cqprotocol` Create study queue parameters for liquids (M)

setfrq — Set frequency of rf channels (C)

Syntax: `setfrq<(channel)><('nucleus')>`

Description: Calculates frequencies based on the nucleus (`tn`, `dn`, `dn2`, etc.), referencing (`lockfreq`), solvent, and the offset parameter (`tof`, `dof`, etc.). The result of the calculation is stored in parameters `sfrq`, `dfrq`, `dfrq2`, etc. The parameters are rounded to the resolution of the channel—either 0.1 or 100 Hz.

The `setfrq` command should never need to be entered from the keyboard. It is called automatically when the appropriate parameters are changed or a parameter set is returned. If a parameter is entered that affects a single frequency, `setfrq` is called from an internal underscore macro (e.g., `_tn`, `_tof`, `_dn`, `_dof`) to recalculate the frequency for that channel. Likewise, if a parameter is entered that affects all frequencies, `setfrq` is called from an internal underscore macro (e.g., `_solvent`, `_lockfreq`) to recalculate the frequencies.

Arguments: `channel` is a single integer specifying the rf channel to be set. The default is to calculate the frequencies for all rf channels.

`nucleus` displays or returns the frequency of the supplied nucleus. Channel 1 is assumed for rounding information and an offset (e.g., `tof` or `dof`) is not added to the result.

Examples:
```
setfrq
setfrq(2)
setfrq('P31'):freq
```

See also: *NMR Spectroscopy User Guide*

Related: `spcfrq` Display frequencies of rf channels (M)

`setgauss` Set a Gaussian fraction for lineshape (M)

Syntax:
(1) `setgauss(fraction)`
(2) `setgauss(fraction*)`

Description: Modifies the output of a deconvolution using pure Lorentzian lineshape (`fitspec.outpar`) and makes it the input for a subsequent analysis (`fitspec.inpar`), after first modifying the Gaussian fraction. To allow this fraction to vary, use syntax 1; to fix the fraction, use syntax 2.

Arguments: `fraction` is the Gaussian fraction of the lineshape, a number from 0 to 1. To fix the fraction (syntax 2), suffix the value with an asterisk (`*`) and enclose the value in single quotes (see the second example below).

Examples:
```
setgauss(0.4)
setgauss('1.0*')
```

See also: *NMR Spectroscopy User Guide*

Related: `fitspec` Perform spectrum deconvolution (C)

`setgcal` Set the gradient calibration constant (M)

Applicability: Systems with pulsed field gradients (PFG) or imaging capabilities.

Description: Determines the gradient calibration constant `gcal` by using a proton phantom of known dimensions. `setgcal` requests the linear dimension of the phantom in the readout direction. It uses the value entered, together with cursor separation of this dimension from the image profile and the strength of the readout gradient `gzlvl1` if pulsed field gradients, to calculate `gcal` in units of gauss/cm-DAC units. You are then prompted whether this value should be entered. If you answer yes, it is stored as a system constant in the your global file.

Note that a particular value of `gcal` is closely related to the current eddy current compensation settings. If these settings are changed (e.g., reading in a new `curecc` file), a different value of `gcal` should be expected.

Before running `setgcal`, use the pulse sequence set up by `profile` to acquire a signal from a known sized object while the gradient is on.

See also: *Pulsed Field Gradient Modules Installation; VnmrJ Imaging NMR*

Related: `gcal` Gradient calibration constant (P)
`profile` Set up pulse sequence for gradient calibration (M)

`setgcoil` Assign sysgcoil configuration parameter (M)

Syntax: `setgcoil<(file)>`

Description: Allows users to change the configured `gcoil` for the system. `setgcoil` updates the systemglobal parameter `sysgcoil` to the named table and updates the assignment value of the parameter `gcoil` in the named table. The directory

$vnmrsystem/imaging/gradtables must have write permission for all users for the macro to be effective. This table now exists in the system local /var/vnmr/gradtables directory, with a soft link from $vnmrsystem/imaging/gradtables to that directory.

Arguments: file is the any legal file name defined for the parameter gcoil.

See also: *VnmrJ Imaging NMR*

Related:		
	config	Display current configuration and possible change it (M)
	gcoil	Read data from gradient calibration tables (P)
	sysgcoil	System value for gcoil parameter (P)

setgrid — Divide graphics window into rows and columns (C)

Syntax: setgrid(row<,column>)

Description: Divides graphics window into an array of rows and columns (or window panes). Only one pane is active at a time. An individual pane can be activated by double-clicking in it with the left mouse button or by entering setwin in the input window.

Arguments: row is the number of rows (maximum is 3) in the graphics window. If 0 is entered, the number of rows remains the same; e.g., in setgrid(0,2), the number of rows is unchanged and two columns are created in each row.

column is the number of columns (maximum is 3) in the graphics window.

Examples:
```
setgrid(3)
setgrid(3,3)
setgrid(0,2)
```

See also: *NMR Spectroscopy User Guide*

Related:		
	curwin	Current window (P)
	fontselect	Open FontSelect window (C)
	jwin	Activate current window (M)
	mapwin	List of experiment numbers (P)
	setwin	Activate selected window (C)

setgroup — Set group of a parameter in a tree (C)

Syntax: setgroup(parameter,group<,tree>)

Description: Sets the group of a parameter in a tree.

Arguments: parameter is the name of the parameter.

group is one of the following keywords: 'all', 'sample', 'acquisition', 'processing', 'display', or 'spin'.

tree is one of the keywords 'current', 'global', or 'processed'. The default is 'current'. See the create command for information on the types of trees.

Examples:
```
setgroup('a','sample')
setgroup('b','all','global')
```

See also: *User Programming*

Related:		
	create	Create new parameter in a parameter tree (C)
	destroy	Destroy a parameter (C)
	destroygroup	Destroy parameters of a group in a tree (C)
	display	Display parameters and their attributes (C)
	groupcopy	Copy parameters of group from one tree to another (C)
	paramvi	Edit a parameter and its attributes using vi text editor (M)

setlimit	Set limits of a parameter in a tree (C)
setprotect	Set protection mode of a parameter (C)

sethtfrq1 Set a Hadamard frequency list from a line list ((M)

Description: A macro to set the Hadamard frequency list htfrq1 from a line list `curexp+'/dll.out'`. It assumes that the line list has already been created. The macro also sets `ni` to the Hadamard matrix size, creates `htofs1`, and sets `fn1` from the minimum frequency difference in `htfrq1`.

See also: *NMR Spectroscopy User Guide*

Related:

htfrq1	Hadamard frequency list in ni (P)
dll	Display listed line frequencies and intensities (C)
htofs1	Hadamard offset in ni (P)
fn1	Fourier number in the 1st indirectly detected dimension (P)
ni	Number of increments in the 1st indirectly detected dimension (P)

sethw Set values for hardware in acquisition system (C)

Applicability: Syntax 1 through 5 apply to all systems. Syntax 6 applies only to systems with a sample changer. Syntax 7 and 8 apply only to systems with a variable temperature (VT) controller.

Syntax: The following syntax is used with the `sethw` command:

(1) `sethw(<'wait'|'nowait',>par1,val1<,par2,val2,...)`
(2) `sethw('lock','on'|'off')`
(3) `sethw('spin',speed)`
(4) `sethw('spinner','bump')`
(5) `sethw('eject','on'|'off')`
(6) `sethw('loc',location)`
(7) `sethw('vt','reset'|'off')`
(8) `sethw('temp',temperature)`
(9) `sethw('lockfreq',lockfreq_value)`

Description: Sets acquisition system hardware values. `sethw` cannot be used when an acquisition is in progress or when the acqi program is active.

Syntax 1 can be used to set the lock system parameters lockpower, lockgain, lockphase, and z0. This syntax can also be used to set the values of the shims. The particular shim that can be set depends upon the type of shim hardware present in the system. See the description of shimset for a list of the shim names for each type of shim hardware.

Syntax 2 turns the hardware lock on or off.

Syntax 3 controls spinning speed.

Syntax 4 carries the sample to bump by giving it a short burst of eject air. This is sometimes useful to reseat the sample if it is failing to spin.

Syntax 5 ejects and inserts samples into the probe. Entering the command `sethw('eject','on')` is equivalent in function to macros eject and e; and `sethw('eject','off')` is equivalent to macros insert and i.

Syntax 6 sets a location for the sample currently in the magnet on a system with a sample changer. The parameter loc is updated.

Syntax 7 resets the VT controller, useful when changing the probe in a system with VT regulation. By entering `sethw('vt','reset')` after installing a new probe in the magnet and attaching the VT controller interface to the probe, the VT controller is ready to regulate the temperature. No other parameters can be modified by the command. As an alternate, you can manually turn the VT

controller unit off and then back on. Syntax 7 also turns the VT controller off by entering `sethw('vt','off')`.

Syntax 8 sets the temperature in degrees celsius. The host computer does not wait for the temperature to regulate.

Syntax 9 sets the lock frequency, in MHz.

Arguments: `'wait'` or `'nowait'` keyword must be either the first or last argument.

- `'wait'` sends the new values to the acquisition console, verifies these values, and updates the corresponding parameters. This is the default.
- `'nowait'` sends the new values to the console without verifying them or changing parameters.

`parameter1,value1,parameter2,value2,...` are paris of parameter names and their values (see the first two examples below). At least one parameter name and its value must be specified. A maximum of ten parameters can be set.

`'lock','on'` is a keyword pair to turn the hardware lock on.

`'lock','off'` is a keyword pair to turn the hardware lock off.

`'liqbear'` sets the bearing air on level; see `liqbear` parameter.

`'pneufault'` second argument is `'clear'`, `'n'`, `'w'`, or `'y'` to clear or set the pneumatics fault code.

`'spin'` is a keyword that identifies the next argument, `speed`, as the sample spinning speed, in Hz.

`'spinner','bump'` is a keyword pair to bump the sample.

`'eject','on'` is a keyword pair to eject the sample from the probe.

`'eject','off'` is a keyword pair to insert the sample into the probe.

`'loc'` is a keyword to identify that the next argument, `location,` is a number for the sample currently in the magnet (`'loc'` is unrelated to the `loc` parameter).

`'vt','reset'` is a keyword pair to reset the VT controller after the controller has been disconnected from the probe. This is equivalent to turning the VT controller power off and on.

`'vt','off'` is a keyword pair to turn the VT controller off.

`'temp'` is a keyword that identifies the next argument, `temperature`, as the requested sample temperature, in degrees celsius.

`'lockfreq'` is a keyword that the next argument is the lock frequency.

`lockfreq_value` is the `lockfreq` value, in MHz, for the lock frequency.

`'lockrate'` is a number <5000 used internally; usually 20 or 2000.

Examples:

```
sethw('z1c',30,'z2c',-50)
sethw('wait','z1',150,'z2',-400)
sethw('lock','on')
sethw('spin',20)
sethw('spinner','bump')
sethw('eject','on')
sethw('loc',5)
sethw('vt','reset')
sethw('lockfreq',46.042)
```

See also: *NMR Spectroscopy User Guide*

Related:

`loc`	Location of sample in tray (P)
`lockpower`	Lock power (P)
`lockfreq`	Lock frequency (P)
`lockgain`	Lock gain (P)

lockphase	Lock phase (P)
readhw	Read current values of acquisition hardware (C)
spin	Sample spin rate (P)
z0	Z0 field position (P)

setint — Set value of an integral (M)

Syntax: `setint(int_number<,value>)`

Description: Sets the value of an integral.

Arguments: `int_number` is the integral number. It corresponds to the index number displayed by `dli` if all integrals are shown (i.e., `intmod='full'`) or the region if alternating integrals are shown (i.e., `intmod='partial'`).

`value` sets the actual value of the selected integral. The default is `ins`.

Examples:
```
setint(2)
setint(1,3)
```

See also: *NMR Spectroscopy User Guide*

Related:

dli	Display list of integrals (C)
ins	Integral normalization scale (P)
intmod	Integral display mode (P)

setlimit — Set limits of a parameter in a tree (C)

Applicability: All

Syntax:
```
setlimit(name, max,min,step [,tree])
setlimit(name, index[,tree])
```

Description: `setlimit` sets the limits of a variable in a tree.

The limits are max value, min. value and step size. A variable, such as an index into the table, can look up maximum, minimum, and step sizes in a table. Supplying all three (max, min., and step) arguments sets the parameter's protection bits (see `setprotect`) so that the table lookup is turned off. The parameter's protection bits are set so that table lookup is turned on if only a single index argument is supplied.

The step value is only used if the parameter is a real number.

Step Value	*Parameter setting*
< -1	The parameter is set to the nearest larger value that is a power of 2. The `fn` parameter uses a step of -2 to select this case.
>-1 and < 0	The inverse of the parameter is set to the nearest multiple of the absolute value of the step. The sw parameter uses a step of negative of the minimum dwell time to select this mode.
>0 and <1	The parameter is set to the nearest multiple of the step value. As an equation, value = n * step where n is a positive or negative integer.
≥ 1	The parameter is set to nearest value that is a multiple of step relative to the minimum value. For example, `setlimit('var',3,-3,2)` allows only the following values -3, -1, 1, and 3. As an equation, `value = min + n*step` where n is an `integer >= 0`. In this example, the equation is: `value = (-3) + (n * 2)`.

Up to four optional return arguments can be used. The first will return the maximum, the second will return the minimum, and the third will return the step size. The fourth argument will return a 0 if the parameter is not using an indexed table lookup for the maximum, minimum, and step size. If the parameter is

using the table lookup mechanism, the fourth argument will be set to the index for that table.

The variable trees are `'current'`, `'global'`, `'processed'` and `'systemglobal'`. The default tree is `'current'`.

Arguments: `name` — the name of the variable.

`tree` — the variable tree: `current` (the default), global, `processed`, or `systemglobal`.

Examples:
```
setlimit('a',10000,0,.3)
setlimit('b',1e5,-3e2,1,'global')
setlimit('dpwr',9)
```

See also: *User Programming*

Related:

`create`	Create new parameter in a parameter tree (C
`destroy`	Destroy a parameter (C)
`display`	Display parameters and their attributes (C)
`fread`	Read parameters from file and load them into a tree (C)
`fsave`	Save parameters from a tree to a file (C)
`getlimit`	Get the limits of a variable in a tree (C)
`paramvi`	Edit a parameter and its attributes using `vi` text editor (M)
`parmax`	Parameter maximum values (P)
`parmin`	Parameter minimum values (P)
`parstep`	Parameter step size values (P)
`prune`	Prune extra parameters from current tree (C)
`setgroup`	Set group of a parameter in a tree (C)
`setprotect`	Set protection mode of a parameter (C)
`settype`	Change type of a parameter (C)
`setvalue`	Set value of any parameter in a tree (C)

`setlk` Set up lock parameters (M)

Syntax: `setlk(solvent)`

Description: Called from other macros to provide adjustment of locking and shimming as a function of solvent. Removing quotation marks from around different parts of the text file of the macro places that particular section into effect. If the macro is left unchanged, setting `alock='s'` is required in the parameter sets where used.

Arguments: `solvent` is the solvent to be used.

See also: *NMR Spectroscopy User Guide*

Related:

`alock`	Automatic lock status (P)

`setlockfreq` Set lock frequency (M)

Description: Calculates and sets the lock frequency parameter `lockfreq`. Before using `setlockfreq`, you must acquire a signal using ^{1}H as the transmitter nucleus (`tn='H1'`). To avoid errors in calculating frequencies, set `lockfreq='n'` before starting the acquisition.

See also: *VnmrJ Installation and Administration*

Related:

`lockfreq`	Lock frequency (P)
`tn`	Nucleus for observe transmitter (P)

setLP — Set up linear prediction in the direct dimension (M)

Applicability: ALL

Syntax: `setLP(n)`

Description: Sets up linear prediction in the direct dimension using the number of coefficients specified.

Examples: `setLP(3)`

See also: *NMR Spectroscopy User Guide*

Related:

lpext	LP data extension in np dimension (P)
lpfilt	LP coefficients to calculate in np dimension (P)
lpnupts	LP number of data points in np dimension (P)
lpopt	LP algorithm data extension in np dimension (P)
proc	Type of processing on np FID (P)
setrc	Set frequency referencing based upon lock signal shift (M)
strtext	Starting point for LP data extension in np dimension (P)
strtlp	Starting point for LP calculation in np dimension (P)

setLP1 — Set F1 linear prediction parameters (M)

Syntax: `setLP1<(extended_length<,current_length>)>`

Description: Sets F1 linear prediction parameters. If no arguments are specified, the interferograms are quadrupled in length.

Arguments: `extended_length` is the number of complex points now existing (`ni`).

`current_length` is the number of points desired after the (forward) linear prediction.

See also: *NMR Spectroscopy User Guide*

Related:

ni	Number of increments in 1st indirectly detected dimension (P)

setlp0 — Set parameters for zero linear phase (M)

Syntax: `setlp0`

Description: A new value of `ddrtc` is calculated by `setlp0` using the current values of `alfa`, `rof2`, and `lp` to achieve a zero linear phase condition (`lp=0`). A trial experiment must first be acquired and phased for pure absorption before running `setlp0`. A value of `lp` near zero is required for flat base line.

See also: NMR Spectroscopy User Guide

Related

alfa	Set alfa delay before acquisition (P)
ddrtc	Set ddr time constant (P)
lp	First-order phase in directly detected dimension (P)
rp	Zero-order phase in directly detected dimension (P)
sw	Spectral width in directly detected dimension (P)
rof2	Receiver gating time following pulse (P)

setnoether — Disconnect host computer from Ethernet (U)

Description: Disconnects the host computer from the Ethernet network. Only `root` can execute this shellscript properly. `setnoether` does nothing if the system is already disconnected from the Ethernet network.

On systems running Solaris, `setnoether` renames the `hostname.le0`, `defaultdomain`, and `defaultrouter` files so that Ethernet is not activated when the system is rebooted.

See also: *VnmrJ Installation and Administration*

Related: `setether` Connect or reconnect host computer to Ethernet (U)

`setoffset` Calculate offset frequency for given nucleus and ppm (M)

Syntax: `setoffset(nucleus,ppm):offsetfreq`

Description: Using the `setref` macro, `setoffset` calculates the offset frequency for a given chemical shift and returns the value.

Arguments: `nucleus` is the given nucleus.

`ppm` is the chemical shift.

`offsetfreq` returns the offset frequency for the given chemical shift.

Examples:
```
setoffset(tn,5):tof
setoffset('C13',85):dof
```

See also: *NMR Spectroscopy User Guide*

Related: `setref` Set frequency referencing for proton spectra (M)

`setparams` Write parameter to current probe file (M)

Syntax: `setparams(param,value<,nucleus>)`

Description: Writes the value of a parameter to the current probe file. The name of the probe file is referenced from the parameter `probe`.

Arguments: `param` is the name of the parameter to write.

`value` is a string with the value to be written for the parameter.

`nucleus` is the nucleus to write in the probe file. The default is the current value of the parameter `tn`.

Examples:
```
setparams('pw90','10')
setparams('pplvl','60')
setparams('dpwr',$strdpwr,'H1')
```

See also: *NMR Spectroscopy User Guide*

Related:

`addnucleus`	Add new nucleus to existing probe file (M)
`addparams`	Add parameter to current probe file (M)
`addprobe`	Create new probe directory and probe file (M)
`getparam`	Retrieve parameter from probe file (M)
`probe`	Probe type (P)
`tn`	Nucleus for the observe transmitter (P)
`updateprobe`	Update probe file (M)

`setpen` Set maximum number of HP plotter pens (M)

Syntax: `setpen<(maxpen,max_number_pens)>`

Description: Allows the user to interactively define the maximum number of pens when changing to a Hewlett-Packard plotter.

Arguments: `maxpen` is the current value of the parameter `maxpen`.

`maximum_number_pens` is the maximum number of pens to be used. If the value of `max_number_pens` is less than or equal to the current value of the parameter `maxpen`, this value becomes the new value of `maxpen`.

See also: *NMR Spectroscopy User Guide*

Related:

`color`	Select plotting colors from a graphical interface (M)
`maxpen`	Maximum number of pens to use (P)

setplotdev **Return characteristics of a named plotter (C)**

Syntax: `setplotdev<:plotter_type,plotter_host,ppmm,raster>`

Description: Returns information from the `devicenames` and `devicetable` files to identify the characteristics of a plotter. This command need never be entered directly by a user because it is automatically called whenever the `plotter` parameter is set. Note that different "types" of plotters (and printers) are characterized in `devicetable`. The `devicenames` file associates different "names" to a given "type."

Arguments: `plotter_type` returns the type of the named plotter.

`plotter_host` returns the host associated with the plotter.

`ppmm` returns the plotter resolution in points per millimeter.

`raster` returns the value from the `devicetable` file.

See also: *VnmrJ Installation and Administration*

Related:

`plotter`	Plotter device (P)

setpower **Set power and pulsewidth for a given γB1 value (M)**

Syntax: `setpower(γB1,nucleus)`

Description: Sets power level and `pw90` values. For `tn`, `setpower` uses `ref_pwr` and `ref_pw90` from the parameter set or from the probe table. For `dn`, it uses `ref_pwxlvl` and `ref_pwx90` from the parameter set or from the probe table. For `dn2`, it uses `ref_pwx2lvl` and `ref_pwx290` from the parameter set or from the probe table. If the reference power levels and pulse width do not exist, `setpower` uses `tpwr` (`pw90`), `dpwr` (`1/dmf`) or `dpwr2` (`1/dmf2`) (if the nucleus is `tn`, `setpower` uses `tpwr`; if the nucleus is `dn`, it uses `dpwr`; if the nucleus is `dn2`, it uses `dpwr2`).

Arguments: `γB1` is a given `γB1` value.

`nucleus` is a given nucleus.

Examples:
```
setpower(sw,tn)
setpower(5000,H1)
```

Related:

`dn`	Nucleus for first decoupler (P)
`dn2`	Nucleus for second decoupler (P)
`dpwr`	Power level for first decoupler with linear amplifiers (P)
`dpwr2`	Power level for second decoupler (P)
`pw90`	90° pulse width (P)
`sw`	Spectral width in directly detected dimension (P)
`tpwr`	Observe transmitter power level with linear amplifiers (P)

setprotect **Set protection mode of a parameter (C)**

Syntax: `setprotect(parameter,'set'|'on'|'off',bit_vals<,tree>)`

Description: Enables changing the protection bits associated with a parameter.

Arguments: `parameter` is the name of the parameter.

`'set'` causes the current protection bits for the parameter to be completely replaced with the bits specified by `bit_vals`.

`'on'` causes the bits specified in `bit_vals` to be turned on without affecting any other protection bits.

`'off'` causes the bits specified in `bit_vals` to be turned off without affecting any other protection bits.

'list' causes all parameter with the specified bit_vals to be listed. This list may be returned to the calling macro.

'clear' option clears the specified bit_vals from all parameters. For both the list and clear options, the names argument can be ''. The return value when setprotect is called with the list option can be used as the 'names' argument for other forms of setprotect. It can also be names for other commands which use lists of parameter names, such as writeparam and readparam.

bit_vals is the *sum* of the *values* of bits selected from the following list:

Bit	*Value*	*Description*
0	1	Cannot array the parameter
1	2	Cannot change active/not active status
2	4	Cannot change the parameter value
3	8	Causes _parameter macro to be executed (e.g., if parameter is named sw, macro _sw is executed when sw is changed)
4	16	Avoids automatic redisplay
5	32	Cannot delete parameter
6	64	System ID for spectrometer or data station
7	128	Cannot copy parameter from tree to tree
8	256	Will not set array parameter
9	512	Cannot set parameter enumeral values
10	1024	Cannot change the parameter's group
11	2048	Cannot change protection bits
12	4096	Cannot change the display group
13	8192	Look up minimum, maximum, step values in table
14	16384	Parameter marked for locking (P_LOCK; see rtx)
15	32768	Global parameter not shared in multiple VJ viewports
16	65536	Force automatic redisplay in VJ templates

For example, to change the first two protection bits, with values 1 and 2, either enter setprotect twice (once for each value) with the keyword 'on', or enter setprotect once with bit_vals set to 3 (sum of 1 and 2) with the keyword 'set'.

tree is one of the keywords 'global', 'current', 'processed', or 'systemglobal'. The default is 'current'. Refer to the create command for more information on the types of parameter trees.

Examples:
```
setprotect('syn','on',2)
setprotect('pslabel','on',8)
```

See also: *User Programming*

Related:

array	Parameter order and precedence (P)
create	Create new parameter in a parameter tree (C)
destroy	Destroy a parameter (C)
display	Display parameters and their attributes (C)
fread	Read parameters from file and load them into a tree (C)
fsave	Save parameters from a tree to a file (C)
getlimit	Get the limits of a variable in a tree (C)
paramvi	Edit a parameter and its attributes using vi text editor (M)
prune	Prune extra parameters from current tree (C)
setlimit	Set limits of a parameter in a tree (C)

setrc — Set receiver constants (M)

Applicability: VNMRS and 400 - MR systems

Syntax: `setrc`

Description: Sets receiver time constants to optimal values. `alfa` is set to a minimum value from the probe file (default is 10 µs). `rof2` is set to a minimum value from the probe file (default is 25 µs). lp is set to zero. `ddrtc` is set to a value based upon the ddrpm parameter, which is set based upon pulse sequence type (default value `ddrpm = 'p'`). Linear prediction is turned on in the direct dimension if the `ddrtc` value is more than a dwell time. `setrc` is used in the apptype macros for setting up pulse sequences or from the command line to optimize receiver constants.

Description: sets receiver time constants to optimal values.

See also: *NMR Spectroscopy User Guide*

Related

`alfa`	Set alfa delay before acquisition (P)
`rof2`	Receiver gating time following pulse (P)
`pw`	Pulse width (P)
`probe`	Probe type (P)
`ddrtc`	Set ddr precession mode (P)
`ddrpm`	Set ddr precession mode (P)
`sw`	Spectral width in directly detected dimension (P)
`setLP`	Set F1 linear prediction parameters (M)

setref — Set frequency referencing (M)

Syntax: `setref<(nucleus)>:$rfl,$rfp,$reffrq,$refpos`

Description: Calculates the referencing for a given parameter or FID data set, for samples locked on deuterium, and based on the chemical shift of the lock solvent line. `setref` uses information in `/vnmr/solvents` (^{2}H chemical shift for current solvent) and `/vnmr/nuctables/nuctabref` (absolute reference frequencies for NMR nuclei) to predict the position of the reference frequency with the current solvent, spectral window, and spectrometer frequency. `setref` assumes a locked sample.

The macro calculates the (auxiliary) 2H reference frequency (TMS-d1) from the lock frequency (`lockf = lockfreq + lkof/1e6`) as follows:

`H2_TMSfreq = lockf / (1 + solppm/1e6)`

then takes the Ξ values for ^{2}H and `tn` and calculates the auxiliary reference frequency (`reffrq`) for the observe nucleus at the given field strength:

`reffrq = (H2_TMSfreq / Ξ(H2)) * Ξ(tn)`

from this, `rfl` and `rfp` are set:

`rfp=0 rfl = sw/2 - (sfrq - reffrq)*1e6.`

Setting the global (or local) flag `bioref='y'` uses Bio-NMR referencing (based on `nuctables/nuctabrefBio`) rather than standard IUPAC / organic chemistry referencing (based on `nuctables/nuctabref`)

Ξ is the normalized frequency such that the ^{1}H signal from TMS is 100.00 MHz.

This estimate of the frequency based upon the chemical shift value of the lock signal and does not account for temperature, pH, or other factors affecting the chemical shift of the lock solvent.

The default tree is `'current'`.

Arguments: An argument and return values are beneficial for the use of `setref` within other macros such as `setref1` and `setref2`. By default (i.e., without an

argument), setref calculates the referencing for 1D spectra or for the directly detected dimension in nD spectra (f2 in 2D, f3 in 3D).

When only nucleus is used as an argument, setref returns values without setting parameters.

$rfl,$rfp,$reffrq,$refpos are return values for reference peak position, reference peak frequency, reference line frequency, and reference line position, respectively.

Examples:
```
setref
setref('C13'):$rfl,$rfp
```

See also: *NMR Spectroscopy User Guide*

Related:

reffrq	Reference frequency of reference line (P)
refpos	Position of reference frequency (P)
rfl	Reference peak position (P)
rfp	Reference peak frequency (P)
rl	Set reference line in directly detected dimension (M)
setref1	Set frequency referencing for 1st indirectly detected dimension (M)
setref2	Set frequency referencing for 2nd indirectly detected dimension (M)
setup	Set up parameters for basic experiments (M)
tmsref	Reference 1D proton or carbon spectrum to TMS (M)
bioref	Use nuctables/nuctabrefBio) rather than standard IUPAC / organic chemistry

setref1 — Set freq. referencing for 1st indirectly detected dimension (M)

Syntax:
```
setref1(nucleus)
```

Description: Calculates the referencing for the first indirect dimension (f1) in nD parameters and FID data sets, for samples locked on deuterium, and for the solvent specified by the solvent parameter. setref1 uses the setref macro to calculate the reference frequency and based on the chemical shift of the lock solvent line and /vnmr/nuctables/nuctabref (absolute reference frequencies for NMR nuclei) to predict the referencing in f1 (reffrq1, rfl1, rfp1) with the current solvent, sw1, and for the frequency of the specified nucleus.

This estimate of the frequency based upon the chemical shift value of the lock signal, as in setref, and does not account for temperature, pH, or other factors affecting the chemical shift of the lock solvent. Using setref, setref1, and setref2, maintains a consistent reference for all dimensions.

Ξ is the normalized frequency such that the ^{1}H signal from TMS is 100.00 MHz.

Setting the global (or local) flag bioref ='y' uses bio-NMR referencing (based on nuctables/nuctabrefBio) rather than standard IUPAC / organic chemistry referencing (based on nuctables/nuctabref)

See /vnmr/nuctables/nuctabref.

Arguments: nucleus is the frequency-relevant nucleus in f1.

Examples:
```
setref1(tn)
setref1('C13')
```

See also: *NMR Spectroscopy User Guide*

Related:

reffrq1	Reference frequency of reference line in 1st indirect dimension (P)
refpos1	Position of reference frequency in 1st indirect dimension (P)
rfl	Reference peak position (P)
rfl1	Reference peak position in 1st indirectly detected dimension (P)
rfp1	Reference peak frequency in 1st indirectly detected dimension (P)

setref	Set frequency referencing (M)
bioref	Use nuctables/nuctabrefBio

setref2 Set freq. referencing for 2nd indirect detected dimension (M)

Syntax: setref2(nucleus)

Description: Calculates the referencing for the second indirect dimension (f2) in nD parameters and FID data sets, for samples locked on deuterium, and for the solvent specified by the solvent parameter. setref2 uses setref to calculate the reference frequency and based on the chemical shift of the lock solvent line and /vnmr/nuctables/nuctabref (absolute reference frequencies for NMR nuclei) to predict the referencing in f2 (reffrq2, rfl2, rfp2) with the current solvent, sw2, and for the frequency of the specified nucleus.

This estimate of the frequency based upon the chemical shift value of the lock signal, as in setref, and does not account for temperature, pH, or other factors affecting the chemical shift of the lock solvent. Using setref, setref1, and setref2, maintains a consistent reference for all dimensions.

Setting the global (or local) flag bioref ='y' uses bio-NMR referencing (based on nuctables/nuctabrefBio) rather than standard IUPAC / organic chemistry referencing (based on nuctables/nuctabref)

See /vnmr/nuctables/nuctabref.

Arguments: nucleus is the frequency-relevant nucleus in f2.

Examples:
```
setref2(tn)
setref2('C13')
```

See also: *NMR Spectroscopy User Guide*

Related:

reffrq2	Reference frequency of reference line in 2nd indirect dimension (P)
refpos2	Position of reference frequency in 2nd indirect dimension (P)
rfl2	Reference peak position in 2nd indirectly detected dimension (P)
rfp2	Reference peak frequency in 2nd indirectly detected dimension (P)
rl2	Set reference line in 2nd indirectly detected dimension (M)
setref	Set frequency referencing (M)
bioref	Use nuctables/nuctabrefBio

setscout Set up a scout run (M)

Applicability: Systems with LC-NMR accessory.

Description: Designed to help run simple experiments during the setup phase of LC-NMR or to be the first of two experiments run on peaks in a stopped-flow or loop-flushing mode. In the latter application, you can set wexp='setwet au' so that the scout run is analyzed, parameters adjusted, and an appropriate solvent-suppressed experiment run.

If parameters already exist in the current experiment for performing the lc1d pulse sequence, setscout turns off the solvent suppression portion of the sequence; if they do not exist, they are created and set to default values using lc1d.

See also: *NMR Spectroscopy User Guide*

Related:

lc1d	Pulse sequence for LC-NMR (M)
setwet	Set up a solvent-suppressed experiment (M)

S

setssfilter **Set sslsfrq to the frequencies of each suppressed solvents (M)**

Applicability: Systems with LC-NMR accessory.

Description: Sets `sslsfrq` to the frequencies of each of the suppressed solvents.

See also: *NMR Spectroscopy User Guide*

setsw **Set spectral width (M)**

Syntax: `setsw(downfieldppm,upfieldppm)`

Description: Sets `sw` and `tof` for the given spectral window and also does referencing.

Arguments: `downfieldppm` is the downfield frequency, in ppm.

`upfieldppm` is the upfield frequency, in ppm.

Examples:
```
setsw(12,0)
setsw(235,-15)
```

See also: *NMR Spectroscopy User Guide*

Related:

`setsw1`	Set spectral width in evolution dimension (M)
`setsw2`	Set spectral width in 2nd evolution dimension (M)
`sw`	Spectral width in directly detected dimension (P)
`tof`	Frequency offset for observe transmitter (P)

setsw1 **Set spectral width in evolution dimension (M)**

Syntax: `setsw1(nucleus,downfieldppm,upfieldppm):offset`

Description: Sets `sw1` for the given spectral window and also does referencing.

Arguments: `nucleus` returns the nucleus.

`downfieldppm` is the downfield frequency, in ppm.

`upfieldppm` is the upfield frequency, in ppm.

`offset` returns the appropriate offset.

Examples:
```
setsw1(tn,12,0)
setsw1(dn,235,-15):dof
```

See also: *NMR Spectroscopy User Guide*

Related:

`setsw`	Set spectral width (M)
`sw1`	Spectral width in 1st indirectly detected dimension (P)

setsw2 **Set spectral width in 2nd evolution dimension (M)**

Syntax: `setsw2(nucleus,downfieldppm,upfieldppm):offset`

Description: Sets `sw2` for the given spectral window and also does referencing.

Arguments: `nucleus` returns the nucleus.

`downfieldppm` is the downfield frequency, in ppm.

`upfieldppm` is the upfield frequency, in ppm.

`offset` returns the appropriate offset.

Examples:
```
setsw2(tn,12,0)
setsw2(dn,235,-15):dof
```

See also: *NMR Spectroscopy User Guide*

Related:

`setsw`	Set spectral width (M)
`sw2`	Spectral width in 2nd indirectly detected dimension (P)

setselfrqc — Set selective frequency and width (M)

Description: Sets selective frequency and width of the excitation bandwidth for selective excitation. Used after TOCSY1D and Noesy1d selection. Selected frequencies and widths of the excitation bandwidth are used by suselfrq.

Related:

Noesy1d	Change parameters for NOESY1D experiment (M)
suselfrq	Select peak, continue selective excitation experiment (M)
TOCSY1D	Change parameters for TOCSY1D experiment (M)

setselinv — Set up selective inversion (M)

Description: Sets power, pulsewidth, and shape for selective inversion; used by suselfrq. By default, setselinv selects a q3 gaussian cascade pulse if a waveform generator or linear modulator is present. Otherwise, setselinv selects a "rectangular" pulse.

Related:

setselfrqc	Select selective frequency and width (M)
suselfrq	Select peak, continue selective excitation experiment (M)

settcldefault — Select default display templates for pulse sequence (M)

Syntax: settcldefault<(<default><,sequence>)>

Description: Selects the display templates to use as the default for a pulse sequence.

Arguments: default is the name of the set of display templates to use for the default display of the current pulse sequence (defined by the parameter seqfil). If no arguments are given, the user is prompted for the name of the display templates.

sequence defines which pulse sequence will use the default displays of the pulse sequence given as the first argument. The default is the pulse sequence defined by the parameter seqfil.

Examples:

```
settcldefault
settcldefault('cosy')
settcldefault('default2d','HMQC8')
```

See also: *User Programming*

Related:

seqfil	Pulse sequence name (P)

settune — Opens the Auto Tune Setup dialog (M)

Applicability: *VnmrJ Walkup*, Automation

Syntax: settune

Description: Opens a dialog for setting when to tune in automation using ProTune.

See also: *NMR Spectroscopy User Guide* and *VnmrJ Walkup*

Related:

protune	**Macro to start ProTune (M)**
wtune	Specify when to tune (P)

settype — Change type of a parameter (C)

Syntax: settype(parameter,type<,tree>)

Description: Changes the type of an existing parameter. A string parameter can be changed into a string or flag type, or a real parameter can be changed into a real, delay, frequency, pulse, or integer type. Note that settype cannot change a string parameter into a real, or change a real into a string.

Arguments: parameter is the name of an existing parameter.

type is one of the keywords 'string', 'flag', 'real', 'delay', 'frequency', 'pulse', or 'integer'.

tree is one of the keywords 'global', 'current', 'processed', or 'systemglobal'. The default is 'current'. Refer to the create command for more information on the types of parameter trees.

Examples:
```
settype('in','flag','global')
settype('p12','pulse')
```

See also: *User Programming*

Related:

create	Create new parameter in a parameter tree (C)
display	Display parameters and their attributes (C)
setgroup	Set group of a parameter in a tree (C)
setlimit	Set limits of a parameter in a tree (C)
setprotect	Set protection mode of a parameter (C)
setvalue	Set value of any parameter in a tree (C)

setup — Set up parameters for basic experiments (M)

Syntax: `setup<(nucleus<,solvent>)>`

Description: Returns a parameter set to do the experiment requested, complete with positioning of the transmitter and decoupler. Parameters set by setup are recalled from the /vnmr/stdpar directory or from the user's stdpar directory if the appropriate file exists there. Any changes made to the files in these directories are reflected in setup. The default parameters for carbon and proton survey spectra are in files /vnmr/stdpar/C13.par and /vnmr/stdpar/H1.par, respectively. These files should be modified as desired to produce spectra under desirable conditions.

Arguments: nucleus is a nucleus chosen from the files in /vnmr/stdpar or in the user's stdpar directory (e.g., 'H1', 'C13', 'P31').

solvent is a solvent chosen from the file /vnmr/solvents (e.g., 'CDCl3', 'C6D6', 'D2O'). The default is 'CDCl3'.

Examples:
```
setup
setup('H1')
setup('C13','DMSO')
```

See also: *NMR Spectroscopy User Guide*

setup_dosy — Set up gradient levels for DOSY experiments (M)

Description: Initiates a dialogue to set up an array of gzlvl1 values for DOSY experiments. setup_dosy requests the number of array increments and an initial and a final gzlvl1 value and sets up an array that gives increments in gzlvl1 squared between these limits. setup_dosy retrieves the gradient strength from the probe calibration file if probe<>'' and stores it in the local experimental parameter DAC_to_G. If probe='' (i.e., the probe is not defined), then DAC_to_G is set to the current value of the global parameter gcal.

See also: *NMR Spectroscopy User Guide*

Related:

dosy	Process DOSY experiments (M)
DAC_to_G	Parameter to store gradient calibration value in DOSY sequences (P)
setgcal	Set the gradient calibration constant (M)

setvalue — Set value of any parameter in a tree (C)

Syntax: `setvalue(parameter,value<,index><,tree>)`

Description: Sets the value of any parameter in a tree. This command bypasses the normal range checking for parameter entry, as well as bypassing any action that would be invoked by the parameter's protection mode (see the `setprotect` command). If the parameter entry normally causes a `_parameter` macro to be executed, this action also is bypassed.

Arguments:

`parameter` — name of the parameter.

`value` —set value for the parameter.

`index` — number of a single element in an arrayed parameter. The default is 1. A value of 0 for the index resets an arrayed (or non-arrayed) parameter to the one element supplied as the second argument to `setvalue`.

`tree` — keyword `'global'`, `'current'`, `'processed'`, or `'systemglobal'`. The default is `'current'`. Refer to the `create` command for more information on the types of parameter trees.

Examples: `setvalue('arraydim',128,'processed')`

See also: *User Programming*

Related:

`create`	Create new parameter in a parameter tree (C)
`setprotect`	Set protection mode of a parameter (C)

setwave — Write a wave definition string into Pbox.inp file (M)

Syntax: `setwave('sh bw/pw ofs st ph fla trev d1 d2 d0')`

Description: Sets up a single excitation band in the `Pbox.inp` file. An unlimited number of waves can be combined by reapplying `setwave`.

Arguments: A single string of 1 to 10 wave parameters in predefined order. Note that a single quote is required at the start and the end of the entire string, but no single quotes are required surrounding characters and strings inside the entire string.

`sh`	name of a shape file.
`bw/pw`	either the bandwidth, in Hz, or the pulsewidth, in sec.
`ofs`	offset, in Hz.
`st`	number specifying the spin status: 0 for excitation 1 for de-excitation 0.5 for refocusing.
`ph`	phase (or phase cycle, see `wavelib/supercycles`).
`fla`	flip angle. `fla` can override the default flip angle.
`trev`	time reversal. This can be used to cancel time reversal if spin status (`st`) is set to 1 for Mxy.
`d1`	delay, in sec, prior the pulse.
`d2`	delay, in sec, after the pulse.
`d0`	delay or command prior to `d1`. If `d0=a`, the wave is appended to the previous wave.

Examples:

```
setwave('eburp1')
setwave('GARP 12000.0')
setwave('esnob 600 -1248.2 1 90.0 n n 0.001')
```

See also: *NMR Spectroscopy User Guide*

Related:

`Pbox`	Pulse shaping software (U)

S

setwin — Activate selected window (C)

Syntax: `setwin(row<,column>)`

Description: Activates a specific pane in the graphics window. Panes are numbered sequentially from left to right and top to bottom.

Arguments: `row` is the number of the row containing the pane to be activated.

`column` is the number of the column containing the pane to be activated.

Examples:
```
setwin(3)
setwin(1,2)
```

See also: *NMR Spectroscopy User Guide*

Related:

curwin	Current window (P)
fontselect	Open FontSelect window (C)
jwin	Activate current window (M)
mapwin	List of experiment numbers (P)
setgrid	Activate selected window (M)

sf — Start of FID (P)

Description: Sets the start of the FID display. This parameter can be entered in the usual way or interactively controlled by the sf wf button during a FID display.

Values: 0 to the value of at, in seconds.

See also: *NMR Spectroscopy User Guide*

Related:

at	Acquisition time (P)
dcon	Display noninteractive color intensities map (C)
dconi	Interactive 2D data display (C)
df	Display a single FID (C)
sf1	Start of interferogram in 1st indirectly detected dimension (P)
sf2	Start of interferogram in 2nd indirectly detected dimension (P)
vf	Vertical scale of FID (P)
wf	Width of FID (P)

sf1 — Start of interferogram in 1st indirectly detected dimension (P)

Description: Sets the start of the interferogram display in the first indirectly detected dimension.

Values: 0 to $(2 \times ni)/sw1$, in seconds.

See also: *NMR Spectroscopy User Guide*

Related:

ni	Number of increments in 1st indirectly detected dimension (P)
sf	Start of FID (P)
sw1	Spectral width in 1st indirectly detected dimension (P)
wf1	Width of interferogram in 1st indirectly detected dimension (P)

sf2 — Start of interferogram in 2nd indirectly detected dimension (P)

Description: Sets the start of the interferogram display in the second indirectly detected dimension.

Values: 0 to $(2 \times ni2)/sw2$, in seconds.

See also: *NMR Spectroscopy User Guide*

Related:

ni2	Number of increments in 2nd indirectly detected dimension (P
sf	Start of FID (P)

sw2	Spectral width in 2nd indirectly detected dimension (P)
wf2	Width of interferogram in 2nd indirectly detected dimension (P)

sfrq — Transmitter frequency of observe nucleus (P)

Description: Contains the frequency for the observe transmitter. sfrq is automatically set when tn is changed, and it should not be necessary for the user to manually set this parameter.

Values: Number, in MHz.

See also: *NMR Spectroscopy User Guide*

Related:

dfrq	Transmitter frequency of first decoupler (P)
dfrq2	Transmitter frequency of second decoupler (P)
dfrq3	Transmitter frequency of third decoupler (P)
tn	Nucleus for observe transmitter (P)
tof	Frequency offset for observe transmitter (P)
spcfrq	Display frequencies of rf channels (M)

sh2pul — Set up for a shaped observe excitation sequence (M)

Applicability: Systems with waveform generators.

Syntax: sh2pul

Description: Behaves like standard two-pulse sequence S2PUL but with the normal hard pulses changed into shaped pulses from the waveform generator. The name of the shaped pulse associated with pw is pwpat and p1 is p1pat. Information about the specifics of power settings and bandwidths is available from the macros bandinfo and pulseinfo.

See also: *User Programming*

Related:

bandinfo	Shaped pulse information for calibration (M)
p1pat	Shape of an excitation pulse (P)
pwpat	Shape of refocusing pulse (P)
pulseinfo	Shaped pulse information for calibration (M)

shdec — Set up for shaped observe excitation sequence (M)

Applicability: Systems with waveform generators.

Description: Sets up the SHDEC pulse sequence that generates a shaped pulse on the observe channel using the waveform generator. It also allows for programmed (e.g.: multiselective) homodecoupling or solvent presaturation using the observe transmitter, and an optional gradient pulse following the excitation pulse.

See also: *NMR Spectroscopy User Guide*

Related:

Pbox	Pulse shaping software (U)

shell — Start a UNIX shell (C)

Syntax: shell<(command)>:$var1,$var2,...

Description: Brings up a normal UNIX shell for the user. On the Sun, a pop-up window is created. On the GraphOn terminal, the entire terminal is used.

Arguments: command is a UNIX command line to be executed by shell. The default is to bring up a UNIX shell. If the last character in the command line is the symbol &, the command is executed in background, which allows commands to be

entered and executed while the shell command is still running. Note that if this background feature is used, any printed output should be redirected to a file. Otherwise, the output may pop up in the text window at random times.

shell calls involving pipes or input redirection (<) require either an extra pair of parentheses or the addition of ; cat to the shell command string.

$var1, $var2,... are names of variables to hold text lines that are generated as a result of the UNIX command. The default is to display the text lines. Each variable receives a single display line. shell always returns a text line; in many cases, it is a simple carriage return. To prevent this carriage return from being shown, capture it in a dummy variable, such as

```
shell('command'):$dum
```

Examples:

```
shell
shell('ps')
shell('ls -lt'):$filelist
shell(systemdir+'/acqbin/Acqstat '+hostname+' &')
shell('ls -t|grep May; cat')
```

or

```
shell('(ls -t|grep May)')
```

See also: *NMR Spectroscopy User Guide, User Programming*

Related:

shelli	Start an interactive UNIX shell (C)

shelli — Start an interactive UNIX shell (C)

Syntax: `shelli(command)`

Description: On a terminal, runs interactively the UNIX command line given as the argument. No return or output variables are allowed.

Arguments: command is a UNIX command line to be executed.

Examples:

```
shelli('vi myfile')
```

See also: *NMR Spectroscopy User Guide, User Programming*

Related:

shell	Start a UNIX shell (C)

shim — Submit an Autoshim experiment to acquisition (C)

Description: Performs validity checks on the acquisition parameters and then submits an Autoshim experiment to acquisition.

See also: *NMR Spectroscopy User Guide*

Related:

au	Submit experiment to acquisition and process data (C)
change	Submit a change sample experiment to acquisition (M)
ga	Submit experiment to acquisition and FT the result (C)
go	Submit experiment to acquisition (C)
lock	Submit an Autolock experiment to acquisition (C)
sample	Submit change sample, autoshim experiment to acquisition (M)
spin	Submit a spin setup experiment to acquisition (C)
su	Submit a setup experiment to acquisition (M)

shimset — Type of shim set (P)

Description: Configuration parameter for the type of shims on the system. The value of shimset is set using the Shimset label in the Spectrometer Configuration window.

Values: 1 to 14, where the value identifies one of the following shim sets:

1 is a shim set in a Varian 13-shim supply with computer-controlled axial shims z1, z1c, z2, z2c, z3, z4, and radial shims x1, y1, xz, yz, xy, x2y2, x3, y3. Shims can be adjusted from –2047 to +2047. This value is used with the Ultra•nmr shim system when operated from the HIM box (Varian 13 Shims choice in Spectrometer Configuration window).

2 is a shim set in a Oxford 18-shim supply with computer-controlled axial shims z1, z1c, z2, z2c, z3, z4, z5, and radial shims x1, y1, xz, yz, xy, x2y2, x3, y3, xz2, yz2, zxy, zx2y2. Shims can be adjusted from –2047 to +2047 (Oxford 18 Shims choice in Spectrometer Configuration window).

3 is a shim set in a Varian 23-shim supply with computer-controlled axial shims z1, z2, z3, z4, z5, z6, and radial shims x1, y1, xz, yz, xy, x2y2, x3, y3, xz2, yz2, zxy, zx2y2, z3x, z3y, z2x2y2, z2xy. Shims can be adjusted from –32767 to +32767 (Varian 23 Shims choice in Spectrometer Configuration window).

4 is a shim set in a Varian 28-shim supply with computer-controlled axial shims z1, z2, z3, z4, z5, z6, z7, and radial shims x1, y1, xz, yz, xy, x2y2, x3, y3, xz2, yz2, zxy, zx2y2, z3x, z3y, z2x2y2, z2xy, zx3, zy3, z4x, z4y. Shims can be adjusted from –32767 to +32767 (Varian 28 Shims choice in Spectrometer Configuration window).

5 is a shim set in an Ultra•nmr shim system (39 shim channels) with computer-controlled axial shims z1, z1c, z2, z2c, z3, z3c, z4, z4c, z5, z6, z7, z8, and radial shims x1, y1, xz, yz, xy, x2y2, x3, y3, xz2, yz2, zxy, zx2y2, z3x, z3y, z2x2y2, z2xy, zx3, zy3, z4x, z4y, z3x2y2, z3xy, z2x3, z2y3, z3x3, z3y3, z4x2y2, z4xy, z5x, z5y. Shims can be adjusted from –32767 to +32767 (Ultra Shims choice in Spectrometer Configuration window).

6 is a shim set in a Varian 18-shim supply with computer-controlled axial shims z1, z2, z3, z4, z5, and radial shims x1, y1, xz, yz, xy, x2y2, x3, y3, xz2, yz2, zxy, zx2y2. Shims can be adjusted from –32767 to +32767 (Varian 18 Shims choice in Spectrometer Configuration window).

7 is a shim set in a Varian 20-shim supply with computer-controlled axial shims z1, z2, z3, z4, z5, and radial shims x1, y1, xz, yz, xy, x2y2, x3, y3, xz2, yz2, zxy, zx2y2, z3x, z3y. Shims can be adjusted from –32767 to +32767 (Varian 20 Shims choice in Spectrometer Configuration window).

8 is a shim set in a Oxford 15-shim supply with computer-controlled axial shims z1, z2, z3, z4, and radial shims x1, y1, xz, yz, xy, x2y2, zx2y2, xz2, yz2, zxy. Shims can be adjusted from –2047 to +2047 (Oxford 15 Shims choice in Spectrometer Configuration window).

9 is a shim set in a Varian Ultra•nmr shim system II (40 shim channels) with computer-controlled axial shims z1, z1c, z2, z2c, z3, z3c, z4, z4c, z5, z6, z7, z8, and radial shims x1, y1, xz, yz, xy, x2y2, x3, y3, x4, y4, xz2, yz2, zxy, zx2y2, z3x, z3y, z2x2y2, z2xy, zx3, zy3, z4x, z4y, z3x2y2, z3xy, z2x3, z2y3, z3x3, z3y3, z4x2y2, z4xy, z5x, z5y. Shims can be adjusted from –32767 to +32767 (Varian 40 Shims choice in Spectrometer Configuration window).

10 is a shim set in a Varian 14-shim supply with computer-controlled axial shims z1, z1c, z2, z2c, z3, z4, z5, and radial shims x1, y1, xz, yz, xy, x2y2, x3, y3. Shims can be adjusted from –2047 to +2047 (Varian 14 Shims choice in Spectrometer Configuration window).

11 is a shim set in a Varian 8-shim supply with computer-controlled axial shims z1, z2, and radial shims x1, y1, xz, yz, xy, x2y2. Shims can be adjusted from –32767 to +32767 (Whole Body Shims choice in Spectrometer Configuration window).

12 is a shim set in a Varian 26-shim supply with computer-controlled axial shims z1, z2, z3, z4, z5, and radial shims x1, y1, xz, yz, xy, x2y2, x3, y3, xz2, yz2, zxy, zx2y2, z3x, z3y, z2x2y2, z2xy, zx3, zy3, x4, y4. Shims can be adjusted

from –32767 to +32767 (Varian 26 Shims choice in Spectrometer Configuration window).

`13` is a shim set in an Varian 29-shim supply with computer-controlled axial shims z1, z2, z3, z4, z5, z6, and radial shims x1, y1, xz, yz, xy, x2y2, x3, y3, xz2, yz2, zxy, zx2y2, z3x, z3y, z2x2y2, z2xy, zx3, zy3, z4x, z4y, z5x, z5y. Shims can be adjusted from –32767 to +32767 (Varian 29 Shims choice in Spectrometer Configuration window).

`14` is a shim set in a Varian 35-shim supply with computer-controlled axial shims z1, z2, z3, z4, z5, z6, and radial shims x1, y1, xz, yz, xy, x2y2, x3, y3, x4, y4, xz2, yz2, zxy, zx2y2, z3x, z3y, z2x2y2, z2xy, zx3, zy3, z4x, z4y, z3x2y2, z3xy, z4x2y2, z4xy, z5x, z5y. Shims can be adjusted from –32767 to +32767 (Varian 35 Shims choice in Spectrometer Configuration window).

15 is the Varian 15 Shim.

16 is the Ultra 18 Shims.

See also: *VnmrJ Installation and Administration*

Related:

`config`	Display current configuration and possibly change it (M
`readhw`	Read current values of acquisition hardware (C)

`showconfig` Show system configuration settings (M)

See also: Displays the system configuration settings in the text window. To print the settings, enter the following in the VnmrJ command line:
`printon showconfig printoff`.

See also: *VnmrJ Installation and Administration*

Related:

`config`	Display current configuration and possibly change it (M

`showconsole` Show system configuration settings (U)

Description: Displays console hardware configuration parameters and system versions. This information is recorded during console bootup and represents the system hardware options recognized by the acquisition computer. The command is used mainly when troubleshooting or performing diagnostics.

See also: *NMR Spectroscopy User Guide*

Related:

`ihwinfo`	Hardware status of console (C)

`showfit` Display numerical results of deconvolution (M)

Description: After a deconvolution, the results are written into file `fitspec.outpar` in an abbreviated format. `showfit` converts these data to an output format more suitable for examination and printing.

See also: *NMR Spectroscopy User Guide*

Related:

`fitspec`	Perform spectrum deconvolution (C)
`plfit`	Plot deconvolution analysis (M)
`usemark`	Use “mark” output as deconvolution starting point (M)

`showloginbox` Shows operator login dialog (M)

Description: Shows the login dialog for operators.

`shownumx` Show x position of number (P)

Description: Show the **X** position of the number. The bottom left of every spectrum is defined as 0.

See also: *User Programming*

Related: `shownumy` y position counting from bottom left of every spectrum (P)

`shownumy` Show y position of number (P)

Description: Show the **Y** position of the number. The bottom left of every spectrum is defined as 0.

See also: *User Programming*

Related: `shownumx` x position counting from bottom left of every spectrum (P)

`showoriginal` Restore first 2D spectrum in 3D DOSY experiment (M)

Description: Restores the first 2D spectrum in a 3D DOSY experiment (if it has been saved by the `dosy` macro).

See also: *NMR Spectroscopy User Guide*

Related: `dosy` Process DOSY experiments (M)

`showplotter` Show list of currently defined plotters and printers (M)

Description: Shows a list of currently defined plotters and printers.

See also: *NMR Spectroscopy User Guide*

Related: `plotter` Plotter device (P)
`printer` Printer device (P)

`showplotq` Display plot jobs in plot queue (M)

Description: Displays current plot jobs in the plot queue for the active plotter.

See also: *NMR Spectroscopy User Guide*

Related: `killplot` Stop plot jobs and remove from plot queue (C
`showprintq` Display print jobs in print queue (C)

`showprintq` Display print jobs in print queue (M)

Description: Displays current print jobs in the print queue for the active printer.

See also: *NMR Spectroscopy User Guide*

Related: `killprint` Stop print jobs and remove from print queue (C)
`showplotq` Display plot jobs in plot queue (M)

`showprotunegui` show the graphical interface while tuning (P)

Syntax: `showprotunegui='argument'`

Description: This is a global string parameter that does not exist by default. The user can create it to force the ProTune GUI to be shown during normal tuning operation.

Arguments: `'n'` — Do not force the GUI to be shown.

`'y'` — Show the GUI, except in automation.

`'a'` — Always show the GUI, even in automation.

Set `showprotunegui='a' will` cause ProTune to fail in automation unless the proper display permission has been set. Set the display permissions on Linux systems by executing "`xhost local:`" on the Linux command line.

See also: *NMR Spectroscopy User Guide*

Related: protune — Macro to start ProTune (M)

showrfmon — Show RF Monitor Button in Hardware Bar (P)

Applicability: Imaging

Syntax: showrfmon=<value>

Description: Show RF Monitor Button in Hardware Bar.

Values: 1 show RF Monitor button.

-1 hide RF Monitor button.

See also: *VnmrJ Imaging User Guide*

showstat — Display information about status of acquisition (M,U)

Syntax: (From VnmrJ) showstat<(remote_system)>
(From UNIX) showstat <remote_system>

Description: Displays information in the text screen about the status of acquisition on a spectrometer. The command is similar to Acqstat, but displays the information in a non-graphical manner and only once.

Arguments: remote_system is the host name of a remote spectrometer. The default is to display information about acquisition on the local system.

See also: *NMR Spectroscopy User Guide*

Related: Acqstat — Bring up the acquisition status display (U)

sin — Find sine value of an angle (C)

Syntax: sin(angle)<:n>

Description: Finds the sine value of an angle.

Arguments: angle is the angle given in radians.

n is a return value giving the sine of angle. The default is to display the sine value in the status window.

Examples:
```
sin(.5)
sin(val):sin_val
```

See also: *User Programming*

Related:
- asin — Find arc sine of number (C)
- atan — Find arc tangent of a number (C)
- cos — Find cosine value of an angle (C)
- exp — Find exponential value (C)
- ln — Find natural logarithm of a number (C)
- tan — Find tangent value of an angle (C)

sine — Find values for a sine window function (M)

Syntax: sine<(shift<,number_points<,domain>)>

Description: Calculates appropriate values for parameters sb and sbs (if the domain argument is 'f2') or for parameters sb1 and sbs1 (if the domain argument is 'f1') in order to achieve a sine window function. The value of the parameter trace is used if the domain argument is not entered.

Arguments: If shift is greater than 1, the sbs parameter is calculated as 2*sb/shift (sbs1 is calculated as 2*sb1/shift). sine(2) gives a "PI/2-shifted" sine

window, i.e., cosine weighting. `sine(3)` gives a "PI/3" shifted sine window, etc. If `shift` is less than or equal to 1, an unshifted sine window is used (`sbs='n'` or `sbs1='n'`).

`number_points` specifies the number of real points that the window function spans. The value of the window function for subsequent points is 0. `number_points` must be greater than 0 and a multiple of 2. The default is `ni*2` if `trace='f1'`, or `np` if `trace='f2'`.

`domain` is `'f1'` or `'f2'`. The default is the current setting of `trace`.

See also: *NMR Spectroscopy User Guide*

Related:

`np`	Number of data points (P)
`sb`	Sinebell const. in directly detected dimension (P)
`sb1`	Sinebell const. in 1st indirectly detected dimension (P)
`sbs`	Sinebell shift const. in directly detected dimension (P)
`sbs1`	Sinebell shift const. in 1st indirectly detected dimension (P)
`sinesq`	Find values for a sine squared window function (M)
`trace`	Mode for *n*-dimensional data display (P)

`sinebell` Select default parameters for sinebell weighting (M)

Description: Generates initial guess at good sinebell weighting parameters by setting the `sb` and `sb1` parameters to one-half the acquisition time and turning off all other weighting. Use `sinebell` in absolute-value 2D experiments only.

See also: *NMR Spectroscopy User Guide*

Related:

`pseudo`	Set default parameters for pseudo-echo weighting (M)
`sb`	Sinebell const. in directly detected dimension (P)
`sb1`	Sinebell const. in 1st indirectly detected dimension (P)

`sinesq` Find values for a sine-squared window function (M)

Syntax: `sinesq<(shift<,number_points<,domain>)>`

Description: Calculates appropriate values for parameters `sb` and `sbs` (if the `domain` argument is `'f2'`) or for parameters `sb1` and `sbs1` (if the `domain` argument is `'f1'`) in order to achieve a sine-squared window function. The value of parameter `trace` is used if the `domain` argument is not entered.

Arguments: `shift` sets the starting value for the window function. If `shift` is greater than `0`, the starting value is given by `sin p/shift`; otherwise, if `shift` is less than or equal to `0`, the starting value is `0`. The default value is `0`.

`number_points` specifies the number of real points that the window function spans. The value of the window function for subsequent points is 0. The `number_points` argument must be greater than `0` and a multiple of 2. The default is `ni*2` if `trace='f1'`, or `np` if `trace='f2'`.

`domain` is `'f1'` or `'f2'`. The default is the current setting of `trace`.

See also: *NMR Spectroscopy User Guide*

Related:

`ni`	Number of increments in 1st indirectly detected dimension (P)
`np`	Number of data points (P)
`sb`	Sinebell const. in directly detected dimension (P)
`sb1`	Sinebell const. in 1st indirectly detected dimension (P)
`sbs`	Sinebell shift const. in directly detected dimension (P)
`sine`	Find values for a sine window function (M)
`trace`	Mode for *n*-dimensional data display (P)

S

size — Returns the number of elements in an arrayed parameter (O)

Description: In MAGICAL programming, an operator that returns the number of elements in an arrayed parameter.

Examples:
```
r1 = size('d2')
```

See also: *User Programming*

Related:

arraydim	Dimension of experiment (P)
typeof	Return identifier for argument type (O)
length	Determine length of a string (C)

slfreq — Measured line frequencies (P)

Description: Contains a list of measured line frequencies. In iterative spin simulation, a calculated spectrum is matched to the lines in the list. The spinll macro fills in slfreq from the last line listing or a mark operation. Use assign to make assignments between the measured lines and the calculated transitions. slfreq is a global parameter and is displayed by dla.

See also: *NMR Spectroscopy User Guide* .

Related:

assign	Assign transitions to experimental lines (M)
cla	Clear all line assignments (M)
dla	Display spin simulation parameter arrays (M)
fitspec	Perform spectrum deconvolution (C)
mark	Determine intensity of a spectrum at a point (C)
spinll	Set up an slfreq array (M)

slw — Spin simulation linewidth (P)

Description: Sets linewidth for individual transitions in the displayed spectrum. Only one linewidth is provided, so all transitions must be given the same linewidth. If the Set Params button is used in setting up spin simulation parameters, slw is automatically set to the measured linewidth of the tallest line displayed.

slw is also the starting default linewidth for deconvolution calculations. This linewidth will be set automatically when deconvolution is operated using the menu mode and is bypassed if the usemark command has been used in conjunction with two cursor input.

Values: 0.01 to 1e6. The typical value is 1.

See also: *NMR Spectroscopy User Guide*

Related:

usemark	Use “mark” output as deconvolution starting point (M)

smaxf — Maximum frequency of any transition (P)

Description: Sets the maximum frequency limit for the calculation of the final simulated spectrum. It should be set before the calculation is performed. If the Set Params button is used in setting up spin simulation parameters, smaxf is initialized to sp+wp; which assumes that you have already expanded the region of the spectrum that you wish to simulate before beginning the spin simulation process.

Values: –1e10 to 1e10, in Hz. The typical value is the maximum chemical shift + 50.

See also: *NMR Spectroscopy User Guide*

Related:

sminf	Minimum frequency of any transition (P)
sp	Start of plot (P)
wp	Width of plot (P)

sminf — Minimum frequency of any transition (P)

Description: Sets the minimum frequency limit for the calculation of the final simulated spectrum. It should be set before the calculation is performed. If the Set Params button is used in setting up spin simulation parameters, `sminf` is initialized to `sp`, which assumes that you have already expanded the region of the spectrum that you wish to simulate before beginning the spin simulation process.

Values: –1e10 to 1e10, in Hz. The typical value is 0.

See also: *NMR Spectroscopy User Guide*

Related:

`smaxf`	Maximum frequency of any transition (P)
`sp`	Start of plot (P)
`wp`	Width of plot (P)

smsport — Sample Management System serial port connection (P)

Description: Sets which serial port on the host computer is connected to a Sample Management System (i.e., a sample changer). The value of `smsport` is set using the Sample Changer Serial Port label in the Spectrometer Configuration window.

Values: `'a'` sets the connection for serial port A. This value is the default.
`'b'` sets the connection for serial port B.

See also: *VnmrJ Installation and Administration; NMR Spectroscopy User Guide*

Related:

`config`	Display current configuration and possibly change it (M)

sn — Signal-to-noise ratio (P)

Description: Sets a ratio for testing signal-to-noise. The `testsn` macro checks whether a signal-to-noise ratio equal to `sn` has been achieved.

Values: Typical value is 35.

See also: *NMR Spectroscopy User Guide*

Related:

`dsn`	Measure signal-to-noise (C)
`getsn`	Get signal-to-noise estimate of a spectrum (M)
`testsn`	Test signal-to-noise of a spectrum (M)
`testct`	Check *ct* for resuming signal-to-noise testing (M)

solppm — Return ppm and peak width of solvent resonances (M)

Syntax: `solppm:chemical_shift,peak_width`

Description: Returns to the calling macro information about the chemical shift and peak spread of solvent resonances in various solvents for either ^{1}H or ^{13}C, depending on the observe nucleus `tn` and the parameter `solvent`. This macro is used "internally" by other macros only.

Arguments: `chemical_shift` returns the chemical shift of the solvent in ppm.

`peak_width` returns the approximate peak spread of solvent resonances.

See also: *User Programming*

Related:

`solvent`	Lock solvent (P)
`tn`	Nucleus for observe transmitter (P)

S

solvent — Lock solvent (P)

Description: Contains one of a series of lock solvents from the `/vnmr/solvents` file, which contains the ^{2}H chemical shift of each lock solvent. By editing the file, additional solvents can be added. Values for `solvent` are not case- sensitive (e.g., `solvent='C6D6'` and `solvent='c6d6'` are identical)

The `auto_dir` macro now controls most of the automation features, including setting the value of `solvent`.

Values: Standard values in `/vnmr/solvents` include:

Deuterium Oxide	CDCl3	MethyleneChloride
D2O	Cyclohexane	MethylAlcohol-d4
Acetone	C6Dl2	CD2Cl2
CD3COCD3	Toluene	CD3OD
Benzene	C6D5CH3	Chloroform
C6D6	Acetic_Acid	
DMSO	CD3COOD	

See also: *NMR Spectroscopy User Guide*

Related:

`lastlk`	Last lock solvent used (P)
`solvinfo`	Retrieve information from solvent table (C)
`tof`	Frequency offset for observe transmitter (P)

solvinfo — Retrieve information from solvent table (C)

Syntax: `solvinfo(solvent):$chemical_shift,$name`

Description: Retrieves solvent shift and solvent name from the solvent table.

Arguments: `solvent` is the name of a solvent from the `/vnmr/solvents` file. This argument is not case-sensitive (e.g., `'c6d6'` is the same as `'C6D6'`).

`chemical_shift` returns the chemical shift of the solvent, in ppm.

`name` returns the name of the solvent. The name returned will match the case of the letters (upper or lower) in `/vnmr/solvents`.

Examples:

```
solvinfo('acetone'):$shift
solvinfo('d2o'):$shift,solvent
```

See also: *NMR Spectroscopy User Guide*

Related:

`lookup`	Look up words and lines from a text file (C)
`solvent`	Lock solvent (P)

sort — Sort real values of a parameter (M)

Syntax: `sort(parametername<,sortType>:order,val`

Description: Sorts the real values of a parameter. The `sort` macro is not used for parameters holding string values. The default behavior is to the array into values of increasing value. A `sortType` can be given to sort into descending order ('r').

If only unique values are wanted, the 'u' `sortType` can be used. The 'ru' `sortType` given unique values in descending order.

The name of a parameter is the first argument to sort. Two return values hold the results of the sort. The first return value is an array containing the original indexes of the sorted array. The second return value gives the sorted array.

Examples: With `par=10,8,6,4,2` the `display('par')` command will show:

```
[1] = 10
[2] = 8
[3] = 6
[4] = 4
[5] = 2
```

The command `sort('par'):$order,$val` will set:

```
$order=5,4,3,2,1
$val =2,4,6,8,10
```

sp — Start of plot in directly detected dimension (P)

Description: Low-frequency limit of the display or plotted region of the spectrum. `sp` is always stored in Hz, but can be entered in ppm by using the `p` suffix (e.g., `sp=2p` sets the start of plot to 2 ppm).

See also: *NMR Spectroscopy User Guide*

Related:

`sp1`	Start of plot in 1st indirectly detected dimension (P)
`sp2`	Start of plot in 2nd indirectly detected dimension (P)

sp1 — Start of plot in 1st indirectly detected dimension (P)

Description: Analogous to the `sp` parameter except that `sp1` applies to the first indirectly detected dimension of a multidimensional data set.

See also: *NMR Spectroscopy User Guide*

Related:

`sp`	Start of plot in directly detected dimension (P)
`sp2`	Start of plot in 2nd indirectly detected dimension (P)

sp2 — Start of plot in 2nd indirectly detected dimension (P)

Description: Analogous to the `sp` parameter except that `sp2` applies to the second indirectly detected dimension of a multidimensional data set.

See also: *NMR Spectroscopy User Guide*

Related:

`sp`	Start of plot in directly detected dimension (P)

spadd — Add current spectrum to add/subtract experiment (C)

Syntax:
(1) `spadd<(multiplier<,shift>)>`
(2) `spadd('new')`
(3) `spadd('trace',index)`

Description: Performs noninteractive spectral addition. The last displayed or selected spectrum is added to the current contents of the add/subtract experiment (`exp5`). A multi-element add/subtract experiment can be created using the `'new'` keyword. Individual spectra in a multi-element add/subtract experiment can be subsequently added to using the `'trace'` keyword followed by an index number of the spectrum.

Arguments: `multiplier` is a value to multiply each spectrum being added to the add/subtract experiment (`exp5`). The normal range of `multiplier` would be `+1` to `−1` but the range is actually unlimited. The default is 1.0.

`shift` is the number of data points to shift each spectrum. A positive value shifts the spectrum being added to a higher frequency, or to the left. A negative value shifts the spectrum to a lower frequency, or to the right. The default is 0.

`'new'` is a keyword to create a new spectrum in the add/subtract experiment.

'trace' is a keyword to select the spectrum given by the index number argument (index) and add it to the add/subtract experiment. The default is to add to the first spectrum in the add/subtract experiment.

index is the index number of the spectrum to be used as a target in a multi-element add/subtract experiment.

Examples:
```
spadd
spadd(.5,25)
spadd('new')
spadd('trace',2)
```

See also: *NMR Spectroscopy User Guide*

Related:

add	Add current FID to add/subtract experiment (C)
addi	Start interactive add/subtract mode (C)
cladd	Clear add/subtract experiment (C)
ds	Display a spectrum (C)
jexp	Join existing experiment (C)
select	Select a spectrum without displaying it (C)
spmin	Take minimum of two spectra in add/subtract experiment (C)
spsub	Subtract current spectrum from add/subtract experiment (C)

spcfrq — Display frequencies of rf channels (M)

Description: Displays the parameters sfrq, dfrq, dfrq2, and dfrq3 with seven decimal points (to nearest 0.1) to provide the exact frequencies of each rf channel. The number of values displayed depends on numrfch.

Prior to VNMR version 4.3, spcfrq set the frequency of the observe channel. The parameter sfrq now sets the frequency instead of spcfrq.

See also: *NMR Spectroscopy User Guide*

Related:

dfrq	Transmitter frequency of first decoupler (P)
dfrq2	Transmitter frequency of second decoupler (P)
dfrq3	Transmitter frequency of third decoupler (P)
numrfch	Number of rf channels (P)
setfrq	Set frequency of rf channels
sfrq	Transmitter frequency of observe nucleus (P)

specdc3d — 3D spectral dc correction (P)

Description: Sets whether a 3D spectral dc correction occurs. The spectral dc correction is the last operation to be performed upon the data prior to forming linear combinations of the data, using the coefficients in the 3D coefficient file (coef), and then writing the data to disk. If specdc3d does not exist, it is created by the macro par3d.

Values: A three-character string selected from 'nnn', 'nny', 'nyn', etc. Each character may take one of two values: n for no spectral dc correction along the relevant dimension, and y for spectral dc correction along the relevant dimension. The first character refers to the f_3 dimension (sw, np, fn), the second character refers to the f_1 dimension (sw1, ni, fn1), and the third character refers to the f_2 dimension (sw2, ni2, fn2). The default is 'nnn'.

See also: *NMR Spectroscopy User Guide*

Related:

dc	Calculate spectral drift correction (C)
fiddc3d	3D time-domain dc correction (P)
fn	Fourier number in directly detected dimension (P)
fn1	Fourier number in 1st indirectly detected dimension (P)
fn2	Fourier number in 2nd indirectly detected dimension (P)

ft3d	Perform a 3D Fourier transform (M)
ni	Number of increments in 1st indirectly detected dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
np	Number of data points (P)
par3d	Create 3D acquisition, processing, display parameters (C)
ptspec3d	Region-selective 3D processing (P)
sw	Spectral width in directly detected dimension (P)
sw1	Spectral width in 1st indirectly detected dimension (P)
sw2	Spectral width in 2nd indirectly detected dimension (P)

spin — Submit a spin setup experiment to acquisition (C)

Description: Regulates sample spinning according to the *parameter* spin, using the acquisition computer. It also sets rf frequency, decoupler status, and temperature.

See also: *NMR Spectroscopy User Guide*

Related:

au	Submit experiment to acquisition and process data (C)
change	Submit a change sample experiment to acquisition (M)
ga	Submit experiment to acquisition and FT the result (C)
go	Submit experiment to acquisition (C)
lock	Submit an Autolock experiment to acquisition (C)
sample	Submit change sample, autoshim experiment to acquisition (M)
shim	Submit an Autoshim experiment to acquisition (C)
spin	Sample spin rate (P)
su	Submit a setup experiment to acquisition (M)

spin — Sample spin rate (P)

Description: Selects a regulated spin rate. The rate is changed when a sample is inserted or spin, go, ga, au, or sample are entered.

Values: 0 indicates non-spinning operation.

5 to 39 are spinning rates.

'n' leaves the spin rate at the currently used value and does not wait for regulated spinning before performing acquisition.

See also: *NMR Spectroscopy User Guide*

Related:

au	Submit experiment to acquisition and process data (C)
ga	Submit experiment to acquisition and FT the result (C)
go	Submit experiment to acquisition (C)
sample	Submit change sample, Autoshim experiment to acquisition (M)
sethw	Set values for hardware in acquisition system (C)
spin	Submit a spin setup experiment to acquisition (C)

spincad — Run SpinCAD program (C)

Applicability: SpinCAD Software.

Description: Opens the graphical pulse sequence generation utility.

See also: *SpinCAD*

Related:

vnmr2sc	VNMR to SpinCAD pulse sequence translator (M)

spingen — Compile SpinCAD pulse sequence (M,U)

Applicability: SpinCAD Software.

Syntax: (From VnmrJ)

```
spingen
spingen(pulsesequence)
spingen<(<option,>pulsesequence<,pulsesequence2>)>
spingen('-psg',pulsesequence)
spingen('-all',pulsesequence)
spingen('-dps',pulsesequence)
```

(From UNIX)

```
spingen pulsesequence < pulsesequence2,,>
spingen <option> pulsesequence < pulsesequence2,, >
spingen -psg pulsesequence
spingen -dps pulsesequence
spingen -all pulsesequence
```

Description: Compiles the SpinCAD pulse sequence. The most common usage is the first one (`spingen`, with no arguments), which compiles the current pulse sequence. Two or more options to SpinCAD compilation are: (1) `'-psg'` option: compilation for the acquisition `go` command (2) `'-dps'` option: compilation for dps usage and (3) `'-all'` option: include both of the above options and compilation of any Java programs that the pulse sequence may use.

The `spingen` macro with no arguments does both the `go` and `dps` compilations. Individual compilations for `go` (`'-psg'` option) and `dps` (`'-dps'` option) can also be done (these are rarely used)

In case of SpinCAD sequences and C sequences having the same name, the last compiled sequence will be used for the `go` command. The `isspincad` macro can be used to check if the current sequence is SpinCAD or of C type.

Compilation of a SpinCAD sequence generates two files in the user's `seqlib` directory, `pulsesequence.psg` and `pulsesequence_dps.psg`, for every source file pulsesequence. Compiled SpinCAD files are distinct from the C files, in that they have `.psg` extension in the filenames. Java program files (if used) must reside in `~/vnmrsys/spincad/classes` directory. Java programs are compiled and the class files placed in the same `~/vnmrsys/spincad/classes` directory. The `spingen` macro checks for any Java files in `/vnmr/spincad/classes` directory, if it does not exit in the users's classes directory.

Compilation of a SpinCAD sequence differs from the conventional compilation of C sequences; it involves the expansion of any composites used; transformation of parallel events to a format that Jpsg program can resolve.

Arguments: <no option> – compilations for `go` and `dps`
`-psg` – compilation for `go` only
`-dps` – compilation for `dps` only
`-all` – compilations for `go`, `dps`, and also compile any Java programs called from the SpinCAD sequence.

See also: *SpinCAD*

Related: `spincad` Display SpinCAD interface (M)

spinll — Set up a slfreq array (M)

Syntax: `spinll<('mark')>`

Description: Copies a list of frequencies to the `slfreq` parameter in iterative spin simulation and runs `dla`. This macro also clears previous line assignments.

Arguments: `'mark'` is a keyword to copy the list of frequencies from the `mark1d.out` file to `slfreq`. The default is to copy the frequencies from the last line listing by `nll` or `dll` to the `slfreq`. Use the cursor and the mark button to place the

lines to be assigned in mark1d.out. Enter mark('reset') to clear the file, and use nl to move the cursor to the center of a selected line.

See also: *NMR Spectroscopy User Guide*

Related:

dla	Display line assignments (M)
dll	Display listed line frequencies and intensities (C)
mark	Determine intensity of the spectrum at a point (C)
nl	Position the cursor at the nearest line (C)
nll	Find line frequencies and intensities (C)
slfreq	Measured line frequencies (P)

spinner — Open the Spinner Control window (C)

Description: Opens the Spinner Control window. This window has the following capabilities:

- Turn the sample spinner off.
- Turn the sample spinner on at a specified speed, in Hz.
- Enable spinner control from within an experiment using the spin parameter and the spin, go, ga, or au commands. This mode is the default.
- Alternatively, turn off experiment control of the sample spinner and allow only the Spinner Control window (and acqi and sethw) to set the spinning speed. This mode has the advantage that, often times, the spin parameter is different between experiments. Joining a different experiment and entering go can unexpectedly change the spinning speed. This alternate mode prevents this problem. In this mode, when a go, su, ga, or au is entered, the spin parameter is first set to the speed selected in the Spinner Control window and then the spin parameter is set to "Not Used."
- Select the style of spinner: low-speed style or a high-speed style. If the high-speed style of spinner (used for solids) is selected, the choice of setting the spinning speed or the air flow rate is provided. Setting the air flow rate is useful when setting up the solids spinning apparatus.

If the spinning speed is controlled only through the Spinner Control window, the action to be taken after a spinner error can be selected:

- Display a warning but continue acquisition.
- Stop acquisition and display a warning.

If experiment control of spinning speed is selected, these selections are faded because they are inoperative, and the selection of the action to be taken after a spinning speed error is provided by the parameter in.

See also: *NMR Spectroscopy User Guide*

Related:

acqi	Interactive acquisition display process (C)
au	Submit experiment to acquisition and process data (C)
change	Submit a change sample experiment to acquisition (M)
ga	Submit experiment to acquisition and FT the result (C)
go	Submit experiment to acquisition (C)
in	Lock and spin interlock (P)
lock	Submit an Autolock experiment to acquisition (C)
sample	Submit change sample, autoshim experiment to acquisition (M)
sethw	Set values for hardware in acquisition system (C)
shim	Submit an Autoshim experiment to acquisition (C)
spin	Sample spin rate (P)
su	Submit a setup experiment to acquisition (M)

spins — Perform spin simulation calculation (C)

Syntax: `spins<(options)>`

Description: Performs a spin simulation, using the current spin system parameters. Refer to the description of `spsm` for setting up the parameters. Use `dsp` to display the spectrum resulting from the simulation. The output file is `spins.list` in the current experiment. This file includes the calculated transitions ordered by frequency.

Line assignments are required for the iteration. These consist of a list of observed frequencies, which is stored in the arrayed parameter `slfreq`, and the line assignments stored in the array `clindex`. `spinll` copies the frequencies from the last line listing by `nll` or `dll` into the parameter `slfreq`. The line listing can be from an observed spectrum or from the results of deconvolution. After `spinll`, line assignments are most easily made by entering `assign`. `dla` displays the assignments. Single assignments can also be made by `assign(transition_number,line_number)`, where `transition_number` is the index of a transition and `line_number` is the index of the measured line. Setting the `line_number` argument to 0 deletes assignments. `dla('long')` produces an expanded display of assignments.

Be aware that spin simulation line numbers and line list line numbers are *not* the same. Conventional line lists produced by `dll` number the lines from left to right (low- to high-field). The spin simulation software numbers lines according to a more complicated scheme, and these numbers are rarely if ever in frequency order.

The parameters to be iterated are chosen by setting the string parameter `iterate` (e.g, `iterate='A,B,JAB'`). If several parameters have the same value due to symmetry, use `iterate='A,B,C,JAB,JAC=JAB'`. This string sets the iterated parameter `JAC` to `JAB` during the iteration. `JAB` must be defined as an iterated parameter in the string before it can be used at the right side of the equal sign. Sets of parameters with up to six members may be set up in this way. The member in the set that is used on the right side of the equal sign must always come first in the parameter display (e.g., `JAB=JAC` would be wrong). A parameter is held constant during iteration if it is not included in the `iterate` string.

The command `initialize_iterate` sets `iterate` to iterate all spins not named X, Y, or Z and the associated coupling constants.

Following an iterative spin simulation, `dga` displays the new values of the coupling constants and chemical shifts. `undospins` restores a spin system as it was before the last iterative run. It returns the chemical shifts, coupling constants, and line assignments, making it possible to continue from this state with modified line assignments.

Note that major changes in the starting values of parameters may change the numbering of the energy levels and hence the line numbers. The line assignments would then be incorrect and would have to be reentered.

For a successful iteration, it is often necessary to keep some parameters fixed. For example, it is sometimes useful to alternately iterate couplings and shifts, keeping one group fixed while the other is iterated independently.

Arguments: The following variations of `spins` are available:

- `spins('calculate','energy')` puts an energy-level table in the output file.
- `spins('calculate','transitions')` puts a second table of transitions ordered by transition number in the output file.
- `spins('display')` and `dsp` are equivalent.
- `spins('system','spinsystemname')` and `spsm('spinsystemname')` are equivalent.

- `spins('iterate')` runs interactively to match experimental and calculated lines.
- `spins('iterate','iteration')` lists parameters after each iteration in the output file.
- `spins('iterate'<,options>)` provides for determining the chemical shifts and coupling constants to produce a spectrum that matches a table of observed lines. `spins` iterates until the rms (root-mean-square) error of the line matching meets a built-in test, unless it first reaches the value given by `number_iterations`. Iteration also stops if the rms error increases.
- Put multiple list options into the second argument, separated by a blank (e.g., `spins('calculate','transitions energy')`).

Examples:
```
spins
spins('calculate','energy')
spins('iterate')
```

See also: *NMR Spectroscopy User Guide*

Related:

`assign`	Assign transitions to experimental lines (M)
`clindex`	Index of experimental frequency of a transition (P)
`dga`	Display parameter groups (spin simulation) (C)
`dla`	Display line assignments (M)
`dll`	Display listed line frequencies and intensities (C)
`dsp`	Display calculated spectrum (C)
`initialize_iterate`	Set `iterate` to contain relevant parameters (M)
`iterate`	Parameters to be iterated (P)
`niter`	Number of iterations (P)
`nll`	Find line frequencies and intensities (C)
`slfreq`	Measured line frequencies (P)
`spinll`	Set up `slfreq` array (M)
`spsm`	Enter spin system (M)
`undospins`	Restore spin system as before last iterative run (M)

`split` Split difference between two cursors (M)

Description: Repositions the left-hand cursor halfway between its original position and the position of the other cursor. This macro is very useful for finding the center of a powder pattern: place the two cursors on the horns of the pattern and then enter `split` to give the center.

See also: *NMR Spectroscopy User Guide*

Related:

`delta`	Difference of two frequency cursors (P)

`spintype` Spinner Type ((P)

Description: This global parameter determines which spinner hardware is used.

Values:
`'liquids'` for low speed spinning of 5 and 10 mm liquids samples
`'tach'` for high speed spinning of 5 and 7 mm Jacobsen probes
`'mas'` for high speed spinning using standalone spinner
`'nano'` for spinning of nano probes
`'none'` for no spinner controller is present, e.g. imaging

spmax — Take the maximum of two spectra (C)

Description: Takes the maximum of two spectra, considered point-by-point in an absolute-value sense. For example, if the two corresponding values are –2 and +3, the `spmax` spectrum will have +3; if the two values are +2 and –3, the `spmax` spectrum will have –3 at that point.

spmin — Take minimum of two spectra in add/subtract experiment (C)

Description: Takes the minimum of two spectra, considered point-by-point in an absolute-value sense. For example, if the two corresponding values are `-2` and `+3`, the `spmin` spectrum will have `-2`; if the two values are `+2` and `-3`, the `spmin` spectrum will have `+2` at that point.

The function of `spmin` is to essentially select for common features within two spectra while eliminating features that are not common between them. In particular, if two CP/MAS spectra are obtained at different spin rates, the peaks stay in the same place (and hence the `spmin` spectrum also contains the same peaks), but the sidebands move. If spectrum 1 has baseline where spectrum 2 has sideband, and spectrum 2 has baseline where spectrum 1 has sideband, then the `spmin` spectrum will contain only baseline in these regions, eliminating the spinning sidebands.

See also: *NMR Spectroscopy User Guide*

Related:

`addi`	Start interactive add/subtract mode (C)
`spadd`	Add current spectrum to add/subtract experiment (C)
`spsub`	Subtract current spectrum from add/subtract experiment (C)

spsm — Enter spin system (M)

Syntax: `spsm(spin_system)`

Description: Enables entry of the spin system for spin simulation and creates and initializes the appropriate parameters to describe the various chemical shifts and coupling constants. Chemical shifts can be entered for the X-nucleus, and the spectrum is calculated if that shift is in the window. Generally, however, it is not necessary to enter the X-nucleus chemical shift, and its value has no effect on the spectrum of the remainder of the spin system.

Arguments: `spin_system` is an alphanumeric string of upper-case letters for chemical shift and coupling constant parameters. Chemical shifts are stored in parameters `A` through `Z`, and the coupling constants are stored in the parameters starting with `JAB` and ending with `JYZ`. Different nucleus types are handled by using letters starting with `A` for the first type, `X` for the second, and `M` for the third. Once created, these parameters are entered and modified in the usual way (e.g., `A=78.5 JAC=5.6`). Entry of chemical shifts in ppm is entered by using `sfrq` (e.g., `B=7.5*sfrq`).

Examples:

```
spsm('AB')
spsm('A3B2')
spsm('AB2CMXY')
```

See also: *NMR Spectroscopy User Guide*

Related:

`sfrq`	Transmitter frequency of observe nucleus (P)
`spins`	Perform spin simulation calculation (C)

spsub — Subtract current spectrum from add/subtract experiment (C)

Syntax: (1) `spsub<(multiplier<,shift>)>`
(2) `spsub('new')`
(3) `spsub('trace',index)`

Description: Performs non-interactive spectral subtraction. The last displayed or selected spectrum is subtracted from the current contents of the add/subtract experiment (`exp5`). A multi-element add/subtract experiment can be created using the `'new'` keyword. Individual spectra in a multi-element add/subtract experiment can be subsequently subtracted from using the `'trace'` keyword followed by an index number of the spectrum.

Arguments: `multiplier` is a value to multiply each spectrum being subtracted from the add/subtract experiment (`exp5`). The normal range of `multiplier` would be `+1` to `−1` but is actually unlimited. The default is 1.0.

`shift` is the number of data points to shift each spectrum. A positive value shifts the spectrum being added to a higher frequency, or to the left. A negative value shifts the spectrum to a lower frequency, or to the right. The default is 0.

`'new'` is a keyword to create a new spectrum in the add/subtract experiment.

`'trace'` is a keyword to select the spectrum given by the index number argument (`index`) and subtract it from the add/subtract experiment. The default is to subtract from the first spectrum in the add/subtract experiment.

`index` is the index number of the spectrum to be used as a target in a multi-element add/subtract experiment.

Examples:
```
spsub
spsub(.5,25)
spsub('new')
spsub('trace',2)
```

See also: *NMR Spectroscopy User Guide*

Related:

clradd	Clear add/subtract experiment (C)
ds	Display a spectrum (C)
jexp	Join existing experiment (C)
spadd	Add current spectrum to add/subtract experiment (C)
select	Select a spectrum without displaying it (C)
spmin	Take minimum of two spectra in add/subtract experiment (C)
sub	Subtract current FID from add/subtract experiment (C)

sqcosine — Set up unshifted cosine-squared window function (M)

Syntax: `sqcosine<(<t1_inc><,t2_inc>)>`

Description: Sets up an unshifted cosine-squared window function in 1, 2, or 3 dimensions. The macro checks whether the data is 1D, 2D, and 3D.

Arguments: `t1_inc` is the number of t1 increments. The default is `ni`.

`t2_inc` is the number of t2 increments. The default is `ni2`.

See also: *NMR Spectroscopy User Guide*

Related:

gaussian	Set up unshifted Gaussian window function (M)
ni	Number of increments in 1st indirectly detected dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
pi3ssbsq	Set up pi/3 shifted sinebell-squared window function (M)
pi4ssbsq	Set up pi/4 shifted sinebell-squared window function (M)
sqsinebell	Set up unshifted sinebell-squared window function (M)

S

sqdir — Study queue directory (P)

Description: Specifies the full path directory where a study is stored. It is set when a new study is created.

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup, VnmrJ Imaging User Guide*

Related:

autodir	Automation directory absolute path (P)
globalauto	Automation directory name (P)
save	Save data (M)
sqname	Study queue parameter template (P)
startq	Start a chained study queue (M)
studyid	Study identification (P)
sqname	Study queue parameter template (P)
xminit	Initialize an imaging study queue (M)

sqend — End a study queue (M)

Description: End a study queue. Usually called by other macros, and not used from the command line.

Related:

sqfilemenu	Study queue file menu commands (M)

sqexp — Load experiment from protocol (M)

Applicability: Imaging

Description: Macro to load an experiment from a protocol.

Syntax: `sqexp(experiment <, 'save'>)`

The first argument is the name of the experiment, and is required. The second argument is an optional keyword 'save'. If specified, it first saves parameter changes to the current experiment in the study queue before loading the parameters for the new experiment.

Examples:

```
sqexp('epidw')
sqexp('spuls','save')
```

See also: *VnmrJ Imaging User Guide*

Related:

apptype	Application type (P)
execpars	Set up the exec parameters (M)

sqfilemenu — Study queue file menu commands (M)

Description: A macro to perform commands for the study queue operation. Usually the macro is called from the *study queue file menu* located below the study queue area, and not from the command line.

See also: *VnmrJ Imaging User Guide*

Related:

cqinit	Initialize liquids study queue (M)
cqreset	Reset study queue parameters (M)
sqend	End a study queue (M)
sqreset	Reset study queue parameters for imaging (M)
xminit	Initialize an imaging study queue (M)

sqmode — Study queue mode (P)

Description: A global parameter that specifies the study queue mode. It is used to determine if the study queue acquisition is chained or not.

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:

`startq`	Start a chained study queue (M)
`xmnext`	Find next prescan or next experiment in study queue (M)
`xmwexp`	Processing macro for end of acquisition in study queue (M)

`sqname` Study queue parameter template (P)

Description: Stores a string in the global tree that determines where a study is stored. It is set from the *Save data setup* dialog in the *Utilities* menu. Dollar signs ($) are used to delimit a string to search for a parameter to be used in the study file name. Percent signs (%) are used to delimit a numeric extension, e.g. %Rn%, or time specifications. Strings from the `sampleinfo` file are not used, since studies are created in foreground, not automation. Text not delimited by dollar signs or percent signs is copied from sqname without any changes.

If `sqname` does not start with a slash mark (/), the study is stored in the path given by `autodir` or `globalauto`; otherwise the name is used as is. A revision number is automatically appended. Values: If `sqname` is a null string, it defaults to %R2%, and the resulting study id is a two-digit revision number. The resulting path and file name must be accessible (with read-write permission) by that user.

Examples:

```
sqname='s_%DATE%_%R3%' studyid='s_20040501_001'
sqname='s_$loc$_'        studyid='s_7_01'
sqname='r$vrack$z$vzone$/well$loc$%R0%'
studyid='r1z3/well16'
```

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:

`autodir`	Automation directory absolute path (P)
`autoname`	Prefix for automation data file (P)
`globalauto`	Automation directory name (P)
`sqdir`	Study queue directory (P)
`sqname`	Study queue parameter template (P)
`studyid`	Study identification (P)
`Svfname`	Create path for data storage (C)

`sqpars` Create study queue parameters for imaging (M)

Applicability: Imaging

Description: A macro to create study queue parameters for imaging. Usually called by other macros, and not used from the command line.

See also: *VnmrJ Imaging User Guide*

Related:

`fixpar`	Correct parameter characteristics in experiment (M)

`sqprotocol` Macro to create protocols (M)

Applicability: Imaging

Description: A macro to create protocols for imaging applications. Called by the Make protocols dialogs in the Utilities menu.

`sqreset` Reset study queue parameters for imaging (M)

Applicability: Imaging

Description: Reset study queue parameters for imaging. Usually called by other macros, and not used from the command line.

S

sqrt — **Return square root of a real number (O)**

Description: A operator in MAGICAL programming that returns the square root of a real number. A negative argument to sqrt is evaluated to 0.0. Operator is not used from the command line.

Examples:
```
a = sqrt(b)
```

See also: *User Programming*

Related

asin	Find arc sine of number (C)
atan	Find arc tangent of a number (C)
cos	Find cosine value of an angle (C)
exp	Find exponential value (C)
ln	Find natural logarithm of a number (C)
tan	Find tangent value of an angle (C)
trunc	Truncates real numbers (O)
typeof	Return identifier for argument type (O)

sqsavestudy — **Macro to save study parameters for imaging (M)**

Applicability: Imaging

Description: A macro to save study parameters in the imaging study queue. Usually called by other macros, and not used from the command line.

See also: *VnmrJ Imaging User Guide*

Related:

acquire	Acquire data (M)
sqend	End a study queue (M)
studypar	Study parameters (P)

sqsinebell — **Set up unshifted sinebell-squared window function (M)**

Syntax:
```
sqsinebell<(<t1_inc><,t2_inc>)>
```

Description: Sets up an unshifted sinebell-squared window function in 1, 2, or 3 dimensions. The macro checks whether the data is 1D, 2D, and 3D.

Arguments: t1_inc is the number of t1 increments. The default is ni.

t2_inc is the number of t2 increments. The default is ni2.

See also: *NMR Spectroscopy User Guide*

Related:

gaussian	Set up unshifted Gaussian window function (M
ni	Number of increments in 1st indirectly detected dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
pi3ssbsq	Set up pi/3 shifted sinebell-squared window function (M)
pi4ssbsq	Set up pi/4 shifted sinebell-squared window function (M)
sqcosine	Set up unshifted cosine-squared window function (M)

srate — **Spinning rate for magic angle spinning (P)**

Applicability: Systems with solids module.

Description: Set to the spinning speed for magic angle spinning (MAS). srate must be correct for the pulse sequence set up by xpolar1 to run TOSS or dipolar dephasing correctly. If hsrotor='y', the measured spinning speed is reported in srate for systems that have rotor synchronization.

Values: 0 to 10^7, in Hz.

See also: *NMR Spectroscopy User Guide*

Related:
- `hsrotor` Display rotor speed for solids operation (P)
- `xpolar1` Set up parameters for XPOLAR1 pulse sequence (M)

sread — Read converted data into VnmrJ (C)

Syntax: `sread(file<,template>)`

Description: Reads 32-bit data files into VnmrJ. For Bruker data files in the AMX and AM formats, each file must first be converted using the `convertbru` command before `sread` can read the data in the file into VnmrJ.

Arguments: `file` is the name of a file containing data converted using `convertbru`.

`template` is the full path of a parameter template file, but without appending the `.par` extension on the file name. The default is `bruker.par`. If no parameter template is specified and `bruker.par` cannot be found in the user or system `parlib` directory, `sread` aborts with an error message.

Examples: `sread('brudata.cv','/vnmr/parlib/bruker')`

See also: *NMR Spectroscopy User Guide*

Related:
- `convertbru` Convert Bruker data (M,U)

srof2 — Calculate exact rof2 value for Cold Probes (M)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Calculates the exact value needed for `rof2` to result in a `lp=0` condition for the given `sw`. Works with either `dsp='r'` and `fsq='y'` or with `dsp='i'`. Not compatible with `qcomp`.

Related:
- `dsp` Type of DSP for data acquisition (P)
- `rof2` Receiver gating time following pulse (P)

ss — Steady-state transients (P)

Description: Sets the number of complete executions of the pulse sequence not accompanied by data collection prior to the acquisition of the real data (sometimes known as *dummy scans*). If `ss` is positive, `ss` steady-state transients are applied on the first increment only, and if `ss` is negative, `-ss` steady-state transients are applied at the start of each increment.

Values: `'n'`, `-32768` to `32767`

See also: *NMR Spectroscopy User Guide; User Programming*

ssecho — Set up solid-state echo pulse sequence (M)

Applicability: Systems with a solids module.

Syntax: `ssecho`

Description: Converts a standard two-pulse experiment to a ready-to-run solid-state NMR echo (SSECHO) pulse sequence.

See also: *NMR Spectroscopy User Guide*

ssecho1 — Set up parameters for SSECHO1 pulse sequence (M)

Applicability: System with a wideline solids module.

Description: Sets up a parameter set for the quadrupole echo pulse sequence SSECHO1.

See also: *NMR Spectroscopy User Guide*

ssfilter — Full bandwidth of digital filter to yield a filtered FID (P)

Description: Specifies the full bandwidth of the digital filter applied to the original FID to yield a filtered FID for solvent subtraction. If ssfilter does not exist in the current experiment, enter addpar('ss') to add it. The command addpar('ss') creates additional time-domain solvent subtraction parameters ssfilter, sslsfrq, ssntaps, and ssorder.

Values: 'n', 10 to sw/2, in steps of 0.1 Hz. The default is 100 Hz.

If ssfilter is set to a value and ssorder is set to some value, the zfs (zero-frequency) option of solvent subtraction is selected.

If ssfilter is set to 'n', ("Not Used"), both the lfs (low-frequency suppression) and zfs options are turned off.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
ft	Fourier transform 1D data (C)
parfidss	Create parameters for time-domain solvent subtraction (M)
ssntaps	Number of coefficients in the digital filter (P)
sslsfrq	Center of solvent-subtracted region of spectrum (P)
ssorder	Order of polynomial to fit digitally filtered FID (P)
sw	Spectral width in directly detected dimension (P)
wft	Weight and Fourier transform 1D data (C)

sslsfrq — Center of solvent-suppressed region of spectrum (P)

Description: Specifies the location of the center of the solvent-suppressed region of the spectrum. If sslsfrq does not exist in the current experiment, enter addpar('ss') to add it. addpar('ss') also creates time-domain solvent subtraction parameters ssfilter, ssntaps, and ssorder.

Values: 'n' (or 0) specifies solvent suppresses a region centered about the transmitter frequency. This is the default

Non-zero value shifts the solvent-suppressed region by sslsfrq Hz. Multiple regions may be suppressed by arraying the value of sslsfrq. Up to 4 values are allowed.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
parfidss	Create parameters for time-domain solvent subtraction (M)
ssfilter	Full bandwidth of digital filter to yield a filtered FID (P)
ssntaps	Number of coefficients in the digital filter (P)
ssorder	Order of polynomial to fit digitally filtered FID (P)

ssntaps — Number of coefficients in digital filter (P)

Description: Specifies the number of taps (coefficients) to be used in the digital filter for solvent subtraction. If ssntaps does not exist in the current experiment, enter addpar('ss') to add it. addpar('ss') also creates time-domain solvent subtraction parameters ssfilter, sslsfrq, and ssorder.

Values: Integer from 1 to np/4. The default is 121. An odd number is usually best.

The more taps in a filter, the flatter the passband response and the steeper the transition from passband to stopband, giving a more rectangular filter.

For the lfs (low-frequency suppression) option, the default is suitable.

For the zfs (zero-frequency suppression) option, a value between 3 and 21 usually works better.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
ft	Fourier transform 1D data (C)
ni	Number of increments in 1st indirectly detected dimension (P)
np	Number of points (P)
parfidss	Create parameters for time-domain solvent subtraction (M)
ssfilter	Full bandwidth of digital filter to yield a filtered FID (P)
sslsfrq	Center of solvent-suppressed region of spectrum (P)
ssorder	Order of polynomial to fit digitally filtered FID (P)
wft	Weight and Fourier transform 1D data (C)

ssorder — Order of polynomial to fit digitally filtered FID (P)

Description: Specifies the order of the polynomial to fit the digitally filtered FID if the zfs (zero-frequency suppression) option is selected for solvent subtraction. `ssorder` is not used if the lfs (low-frequency suppression) option is selected. If `ssorder` does not exist in the current experiment, enter `addpar('ss')` to add it. `addpar('ss')` also creates time-domain solvent subtraction parameters `ssfilter`, `sslsfrq`, and `ssntaps`.

The solvent subtraction option (zfs or lfs) is selected as follows:

- If `ssorder` and `ssfilter` are both set to values, zfs is selected.
- If `ssorder='n'` and `ssfilter` is set to a value, lfs is selected.
- If `ssorder='n'` and `ssfilter='n'`, zfs and lfs are both turned off.

Values: `'n'`, integer from 1 to 20. The default is `'n'`.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
parfidss	Create parameters for time-domain solvent subtraction (M)
ssfilter	Full bandwidth of digital filter to yield a filtered FID (P)
sslsfrq	Center of solvent-suppressed region of spectrum (P)
ssntaps	Number of coefficients in the digital filter (P)
wft	Weight and Fourier transform 1D data (C)

stack — Stacking mode for processing and plotting arrayed spectra (M)

Syntax: `stack(mode)`

Description: When processing and plotting arrayed 1D spectra, VnmrJ automatically determines if the *stacking mode* is horizontal, vertical or diagonal from the number of traces and the number of lines in the spectrum. If you do not want this automatic function (or it makes an undesirable decision), you can override it by placing the `stack` macro in the experiment startup macro or by calling `stack` before processing (or reprocessing) a spectrum. The macro `autostack` switches back to automatic determination of the stack mode by destroying the parameter `stackmode`.

Arguments: `mode` is one of the stacking modes `'horizontal'`, `'vertical'`, or `'diagonal'`.

See also: *NMR Spectroscopy User Guide*

Related:

autostack	Automatic stacking for processing and plotting arrays (M)
procarray	Process arrayed 1D spectra (M)

plarray	Plot arrayed 1D spectra (M)
stackmode	Stacking control for processing (P)

stackmode — Stacking control for processing arrayed 1D spectra (P)

Description: Controls whether stacking for processing arrayed 1D spectra is automatic or nonautomatic. The *automatic stacking mode* can be overridden by creating and setting `stackmode` in the startup macro or before calling `procplot` or `procarray`. The `autostack` macro switches back to automatic determination of the stack mode by destroying this parameter.

Values: `'horizontal'`, `'vertical'`, or `'diagonal'`.

See also: *NMR Spectroscopy User Guide*

Related:

autostack	Automatic stacking for processing and plotting arrays (M)
procarray	Process arrayed 1D spectra (M)
procplot	Automatically process FIDs (M)
stack	Fix stacking mode for processing and plotting arrayed spectra (M)

startq — Start a chained study queue (M)

Description: Start a chained acquisition for a study queue.

Related:

sqmode	Study queue mode (P)
xmnext	Find next prescan or next experiment in study queue (M)

status — Display status of sample changer (C,U)

Applicability: Systems with an automatic sample changer.

Syntax:
`status<(directory<,config_file>)>`
(From UNIX) `status directory <config_file>`

Description: Displays a status window with a summary of all experiments and a scrollable list of individual experiments. Individual experiments are selected by clicking anywhere on the experiment of interest. `status` updates as the state of an automation run changes. If an experiment finishes or a new experiment is added, the `status` display is updated.

Arguments: `directory` is the path to the directory where the done queue (`doneQ`) is stored. In the UNIX shell, a directory path is required. In VnmrJ, a directory path is optional. The default is the automation mode directory.

`config_file` is the name of a user-supplied file that customizes status for local use. Refer to the manual *User Programming* for details.

Examples:
(From VnmrJ) `status`
(From VnmrJ) `status('/home/vnmr1/AutoRun_621')`
(From UNIX) `status /home/vnmr1/AutoRun_621 mystatus`

See also: *VnmrJ Walkup; User Programming*

Related:

autodir	Automation directory absolute path (P)
autoname	Prefix for automation data file (P)
enter	Enter sample information for automation run (C,U)

std1d — Apptype macro for Standard 1D experiments (M)

Applicability: Liquids

Description: Perform the actions for Standard 1D protocols to set up, process, and plot experiments.

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:

apptype	Application type (P)
execpars	Set up the exec parameters (M)

stdshm — Interactively create a method string for autoshimming (M)

Syntax: stdshm

Description: Creates a method string to be used in adjusting the spinning controls z1, z2, z3, and z4 when a sample is changed. If non-spin controls also need adjusting, further shimming operations are required.

The method string is constructed in answer to questions about the sample length, the time available for shimming, and the solvent T_1 or, in FID shimming, the T_1 of the sample. In asking about sample height, stdshm assumes that z3 and z4 need adjusting only with short samples; therefore, select "sample height will vary" if z3 and z4 shimming is definitely wanted.

Try lock shimming first to see if it produces a satisfactory result. Lock shimming requires a much shorter shimming time than FID shimming and usually adjusts z1 and z2 just as well. If lock shimming is unsatisfactory, try FID shimming. Again, when z3 and z4 adjustment is required, lock shimming is faster, but FID shimming is more effective. stdshm displays the estimated shimming time, permitting revision when the time is too long.

To shim after running stdshm, enter method='std' (for lock shimming) or method='fidstd' (for FID shimming). Then enter shim or set the wshim parameter to shim before the start of acquisition.

Note that the command newshm is much like stdshm but that newshm provides more flexibility in making method strings

See also: *NMR Spectroscopy User Guide*

Related:

dshim	Display a shim method string (M)
method	Autoshim method (P)
newshm	Interactively create a shim method with options (M)
shim	Submit an Autoshim experiment to acquisition (C)
wshim	Conditions when shimming is performed (P)

sth — Minimum intensity threshold (P)

Description: Intensity threshold above which transitions are printed and included in the simulated spectrum. Transitions whose intensity falls below this threshold are omitted from the simulation.

Values: 0 to 1.00. A typical value is 0.05.

See also: *NMR Spectroscopy User Guide*

Related:

spins	Perform spin simulation calculation (C)
spsm	Enter spin system (M)
th	Threshold (P)

string — Create a string variable (C)

Syntax: string(variable)

Description: Creates a string variable without a value.

Arguments: variable is the string variable to be created.

Examples: string('strvar1')

See also: *User Programming*

S

strtext — Starting point for LP data extension in np dimension (P)

Description: Specifies inclusively the complex time-domain data point at which LP (linear prediction) data extension (alteration) is to begin in the np dimension. Enter addpar('lp') to create strtext and other np dimension LP parameters in the current experiment.

Values: 1 to np/2

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
lpalg	LP algorithm in np dimension (P)
np	Number of data points (P)
strtlp	Starting point for LP calculation in np dimension (P)

strtext1 — Starting point for LP data extension in ni dimension (P)

Description: Specifies inclusively the complex time-domain data point at which LP (linear prediction) data extension (alteration) is to begin in the ni dimension. Enter addpar('lp',1) to create strtext1 and other ni dimension LP parameters in the current experiment.

Values: 1 to ni/2

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
lpalg1	LP algorithm in ni dimension (P)
ni	Number of increments in 1st indirectly detected dimension (P)
strtlp1	Starting point for LP calculation in ni dimension (P)

strtext2 — Starting point for LP data extension in ni2 dimension (P)

Description: Specifies inclusively the complex time-domain data point at which LP (linear prediction) data extension (alteration) is to begin in the ni2 dimension. Enter addpar('lp',2) to create strtext2 and other ni2 dimension LP parameters in the current experiment.

Values: 1 to ni2/2

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
lpalg2	LP algorithm in ni2 dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
strtlp2	Starting point for LP calculation in ni2 dimension (P)

strtlp — Starting point for LP calculation in np dimension (P)

Description: Specifies the first complex, time-domain data point to be used in calculating the complex linear prediction (LP) coefficients in the np dimension. If lpopt='b', the strtlp-th complex time-domain data point and the ensuing (2*lpfilt-1) data points are used in this calculation. If lpopt='f', the strtlp-th complex time-domain data point and the preceding (2*lpfilt-1) data points are used in this calculation. Enter addpar('lp') to create strtlp and other np dimension LP parameters in the current experiment.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
lpalg	LP algorithm in np dimension (P)

lpfilt	LP coefficients to calculate in np dimension (P)
lpnupts	LP number of data points in np dimension (P)
lpopt	LP algorithm data extension in np dimension (P)
strtext	Starting point for LP data extension in np dimension (P)

strtlp1 Starting point for LP calculation in ni dimension (P)

Description: Specifies the first complex, time-domain data point to be used in calculating the complex linear prediction (LP) coefficients in the ni dimension. It functions analogously to strlp. Enter addpar('lp',1) to create strtlp1 and other ni dimension LP parameters in the current experiment.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
lpalg1	LP algorithm in ni dimension (P)
lpfilt1	LP coefficients to calculate in ni dimension (P)
lpnupts1	LP number of data points in ni dimension (P)
lpopt1	LP algorithm data extension in ni dimension (P)
strtext1	Starting point for LP data extension in ni dimension (P)

strtlp2 Starting point for LP calculation in ni2 dimension (P)

Description: Specifies the first complex, time-domain data point to be used in calculating complex linear prediction (LP) coefficients in the ni2 dimension. strtlp2 functions analogously to strlp. Enter addpar('lp',2) to create strtlp2 and other ni2 dimension LP parameters in the current experiment.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
lpalg2	LP algorithm in ni2 dimension (P)
lpfilt2	LP coefficients to calculate in ni2 dimension (P)
lpnupts2	LP number of data points in ni2 dimension (P)
lpopt2	LP algorithm data extension in ni2 dimension (P)
strtext2	Starting point for LP data extension in ni2 dimension (P)

studyid Study identification (P)

Applicability: Liquids

Description: Specifies the relative directory where a study is stored. In Walkup, it is relative to autodir. In imaging, it is relative to globalauto; It is set when a new study is created.

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:

autodir	Automation directory absolute path (P)
globalauto	Automation directory name (P)
sqdir	Study queue directory (P)
sqname	Study queue parameter template (P)

studypar Study parameters (P)

Applicability: Liquids, Imaging

Description: A global parameter that contains the list of parameters saved with a study. If the parameter does not exist, it is created by cqsavestudy for liquids or sqsavestudy for imaging when a study is saved.

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup, VnmrJ Imaging User Guide*

Related:		
	cqsavestudy	Macro to save study queue parameters (M)
	sqsavestudy	Macro to save study parameters for imaging (M)

studystatus Study status (P)

Applicability: *VnmrJ Walkup*

Description: The status of a study for a sample. The status is set from the status of the experiments within the study by the macro cqsavestudy.

See also: *VnmrJ Walkup*

Related:		
	cqsavestudy	Macro to save study queue parameters (M)
	studytime	Study time (P)

studytime Study time (P)

Applicability: *Walkup*

Description: The total time it takes to run a study. It is set by the xmtime macro when a study is created.

See also: *VnmrJ Walkup*

Related:		
	xmsubmit	Submit sample(s) to the study queue (M)
	xmtime	Update the study queue time (M)

su Submit a setup experiment to acquisition (M)

Description: Sets up the system hardware to match the current parameters but does not initiate data acquisition. Typical uses of su are to change the system frequency in preparation for probe tuning, to change the sample temperature in advance of beginning an experiment (or after a variable temperature experiment is run), and to turn the decoupler on or off. If load='y', su can be used to set shim values. su also sets lock parameters (lockpower, lockgain, lockphase) and the field offset parameter (z0).

su does *not* delete any existing data in the current experiment (only go, ga, and au do that). Everything that su does is also done by go, ga, and au.

Shim DAC values are automatically loaded when the acquisition system boots up; if the acquisition system has been recently rebooted, su must be entered before acqi or qtune can be run.

See also: *NMR Spectroscopy User Guide*

Related:		
	acqi	Interactive acquisition display process (C)
	au	Submit experiment to acquisition and process data (C)
	change	Submit a change sample experiment to acquisition (M)
	ga	Submit experiment to acquisition and FT the result (C)
	go	Submit experiment to acquisition (C)
	load	Load status of displayed shims (P)
	lock	Submit an Autolock experiment to acquisition (C)
	lockgain	Lock gain (P)
	lockphase	Lock phase (P)
	lockpower	Lock power (P)
	qtune	Tune probe using swept-tune graphical tool (C)
	sample	Submit change sample, autoshim experiment to acquisition (M)
	shim	Submit an Autoshim experiment to acquisition (C)
	spin	Submit a spin setup experiment to acquisition (C)
	z0	Z0 field position (P)

sub — Subtract current FID from add/subtract experiment (C)

Syntax: (1) `sub<(multiplier<,'new'>)>`
(2) `sub('new')`
(3) `sub('trace',index)`

Description: Subtracts the last displayed or selected FID from the current contents of the add/subtract experiment (`exp5`). `lsfid` and `phfid` can be used to shift or phase rotate the selected FID before it is subtracted from the data in add/subtract experiment. A multi-FID add/subtract experiment can be created by using the `'new'` keyword. Individual FIDs in a multi-FID add/subtract experiment can subsequently be subtracted by using the `'trace'` keyword followed by the index number of the FID.

Arguments: `multiplier` is a value that the FID is to be multiplied by before being subtracted from the add/subtract experiment (`exp5`). The default is 1.0.

`'new'` is a keyword to create a new FID element in an add/subtract experiment.

`'trace'` is a keyword to use the next argument (`index`) as the number of the FID to subtract from in an add/subtract experiment. The default is to subtract from the first FID in a multi-FID add/subtract experiment.

`index` is the index number of the FID to be used as a target in a multi-FID add/subtract experiment.

Examples:
```
sub
sub(0.75)
sub('new')
sub('trace',2)
```

See also: *NMR Spectroscopy User Guide*

Related:

`add`	Add current FID to add/subtract experiment (C)
`cladd`	Clear add/subtract experiment (C)
`lsfid`	Number of complex points to left-shift `ni` interferogram (P)
`phfid`	Zero-order phasing constant for `np` FID (P)
`select`	Select a spectrum without displaying it (C)
`spsub`	Subtract current spectra from add/subtract experiment (P)

substr — Select a substring from a string (C)

Applicability: VnmrJ

Syntax:
```
substr('string',word_number):$n1<,$n2<,$n3>>
substr('string',index,length<,'new_string'>):
       n1<,$n2<,$n3>>
substr('string',word_number,'delimiter',
       'delimiter_char'):
       n1<,$n2<,$n3>>
```

Description: Picks a substring or word out of a string, replace, or delete a set of characters from a string and returns the result to the string variable `$n1`. The position of the first character of the word and the number of characters of the word are returned to `$n2` and `$n3` if these string variables are supplied.

Arguments: `'string'` string or a string variable.

`word_number` is the number of the word to select. Words are counted sequential beginning with the first word of the string as 1.

`index` is the number of characters counted from the first character of the string or a string variable containing this number.

`length` is the number of characters in the substring.

`new_string` is string or a string variable to replace the contents of `string` at the position specified by `index` and `length` and pass the resulting string to the return string variable.

`'delimiter'` is a keyword that requires the `'delimiter_char'` argument to specify that the argument that follows specifies the delimiter(s).

`'delimiter_char'` is a string of characters to use as delimiters to separate words.

Default delimiters are space and tab `" \t"`.

`$n1` is the return string variable containing the searched for text.

`$n2` is the return variable containing the position of the first character of the word in the string.

`$num` is the return string variable containing the number of characters in the word specified by `word_number` and contained within the delimiters.

Examples: Search examples:

```
substr('There are 10 samples to be run',4):n1
string n1='samples'
```

```
substr('There are 10 samples to be run',4):n1,$f,$num
sets strings n1='samples' $f=14 and $num=7
```

```
substr('abcdefg',2,3):n1
string n1='bcd'
```

```
substr('This is;a phrase',2):n1
string n1='is;a'
```

```
substr('This is;a phrase',2,
       'delimiter',' ;\t'):n1,$f,$num
       sets strings n1='is' $f=6 and $num=2
```

Text substitution examples:

Explicit text substitution and passing the result to the return string variable.

```
substr('abcdefg',2,3,'1234'):n1
string n1='a1234efg'
```

Text substitution in a string variable using results held in return string variable from a previous search. Start with the following text held in a string variable:

```
n1='There are 10 samples to be run'
substr(n1,4):n2,$f,$num
```

sets strings `n2=samples`, `$f=14`, and `$num=7`

```
substr(n1,$f,$num,'experiments'):n3
```

Counts 14 characters (`$f=14`) from the beginning of `n1`, substitutes the word `experiments` for the 7 character (`$num=7`) word in `n1`, and passes the new string to the return string variable setting

```
n3='There are 10 experiments to be run'
```

See also: *User Programming*

Related:

`length`	Determine length of a string (C)
`string`	Create a string variable (C)

`suselfrq` Select peak, continue selective excitation experiment (M)

Syntax: `suselfrq`

Description: Sets up selective frequency pulse, power, and shape and continue with the selective excitation experiment. Used by `Noesy1d`, and `TOCSY1D`.

See also: *NMR Spectroscopy User Guide*, *VnmrJ Walkup*

Related:

`Noesy1d`	Change parameters for NOESY1D experiment (M)
`setselinv`	Set up selective inversion (M)

setselfrqc	Select selective frequency and width (M)
TOCSY1D	Change parameters for TOCSY1D experiment (M)

svdat — Save data (C)

Syntax: `svdat(file<,'f'|'m'|'i'|'b'>)`

Description: Outputs current data from the current experiment to a file. Integer data is scaled when it is written.

Arguments: `file` is the name of the data file. The file is created in the current directory VnmrJ is in unless a full directory path is given. If a file of the same name already exists, the user will queried to overwrite the file. If a fully qualified filename is not given, the file will be created in VnmrJ's current directory.

`'f'|'m'|'i'|'b'` defines how the data is to be written out: `'f'` is 32-bit floating point, `'m'` or `'i'` is 16-bit integer scaled to 12 bits, and `'b'` is 8-bit byte integer. The default is `'f'`.

Floating point data is not scaled when written.

Integer data is scaled when written. A data value `x` is scaled as `ax+b` where:

```
a = (vs*grays1*numgray)/64.0
b = numgray*(0.5-(grays1*grayctr/64.0))
```

where `numgray` (see below) has a default of 4096 for `'m'` and `'i'` formats and a default of 256 for the `'b'` format, `graysl` has a default of 1, and `grayctr` has a default of 32.0.

To scale 16-bit integer data other than 12-bits, the global parameter `numgray` can be created using `create(numgray,real,global)` and set to the value 2^n, where n is the number of bits desired. For example, to scale to 15-bits, set `numgray=32768`.

The display parameters `graysl` and `grayctr` are used to save data files for ImageBrowser.

Examples: `svdat(rathead,'b')`

See also: *VnmrJ Imaging NMR*

Related:

create	Create new parameter in parameter tree (C)
grayctr	Gray level window adjustment (P)
graysl	Gray level slope (contrast) adjustment (P)

svf — Save FIDs in current experiment (M)

Syntax: `svf<(file<,'nolog'><,'arch'><,'force'><,'nodb'>)>`

Description: Saves parameters, text, and FID data in the current experiment to a file. No data is removed from the current experiment; `svf` merely saves a copy of the data in a different file. You can enter `rt` to retrieve the complete data set, or enter `rtp` to retrieve parameters only.

Arguments: `file` is the name of the file, with the suffix `.fid` added, to be created to save the data. The default is the system prompts for a file name. You are warned if you attempt to overwrite a file that already exists. In fact, if data has been acquired with the `file` parameter set, the data does not need to be saved. It is already stored in a named file.

`'nolog'` is a keyword to not save the log file with the data. The default is to save the log file.

`'arch'` is a keyword to assume that the data goes to a database and appends to the (or creates a) `doneQ` file with information that can be used by the command `status`.

If `force` is given, you are not warned and the older parameter set is removed.

`nodb` is a keyword to prevent `svp` from adding information to a database. This prevention is useful if temporary parameter files are saved that will soon be removed.

Examples:
```
svf
svf('/home/vnmr1/mydatafile')
```

See also: *NMR Spectroscopy User Guide*

Related:

`file`	File name (P)
`rt`	Retrieve FID (M)
`rtp`	Retrieve parameters (M)
`status`	Display status of all experiments (C)

svfdf — Save FID data in FDF format (M)

Syntax: `svfdf(directory)`

Description: Saves raw data from the FID file of the current experiment as an FDF (Flexible Data Format) file. Data is saved in multiple files, with one trace per file. The files are named `fid0001.fdf`, `fid0002.fdf`, etc. The `procpar` file from the current experiment is also saved in the same directory.

The FDF file format is described in the manual *User Programming*. Note that the data is complex (FDF type=`"complex"`), and the FDF ordinate = `{"intensity", "intensity"}`, indicating that each point consists of a pair of intensities. The FDF headers also contain the following special fields:

- `nfile` gives the sequential number of this file in the series.
- `ct` is the value of the `ct` parameter. The data should be divided by `ct` to give the average signal intensity for one scan.
- `scale` gives the power of two scaling factor for the data. The data should be multiplied by $2^{\texttt{scale}}$ to give the true values.

Arguments: `directory_name` is the directory in which to store the files. The extension `.dat` is appended to the given name.

Examples:
```
svfdf(curexp+'/raw')
```

See also: *User Programming*

Related:

`ct`	Completed transients (P)

svfdir — Directory for non-study data (P)

Description: Specifies the directory where data is saved when not using a study in VnmrJ.

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:

`fidsave`	Save data (M)
`save`	Save data (M)
`svfname`	Filename parameter template for non-study data ((P)

Svfname — Create path for data storage (C)

Applicability: Automation

Syntax:
```
Svfname:$path
Svfname(name_template):$path
Svfname(name_template,suffix):$path
Svfname(name_template,suffix,
        excluded_suffix'):$path
```

```
Svfname(name_template,suffix<,'excluded_suffix',
        <'keepspaces'|'replacespaces'>):$path
```

Description: Determines the name used to store data. This command provides the functionality of the autoname parameter without being in automation mode.

`Svfname` default naming command with alternate suffixes is `svfname` and the default directory is `svfdir`. `Svfname` does not read a sample info file. A suffix is specified as the second argument. Use a suffix of '' to access ordinary files and directories. Arguments used with `Svfname` are constructed the same way arguments are constructed for `autoname`.

The name is prefixed with using the value of the parameter `autodir` or `userdir+'/data/'` if `name_template` is a relative path.

The default suffix is `.fid`.

Arguments: `svfname` is default naming parameter.

`svfdir` is default directory parameter.

`name_template` (no quotes) is string that contains keywords separated by substitution specifiers to represent the data storage path. Substitution specifiers in this template are either a percent sign (`%`) or a dollar sign (`$`). The keywords are obtained using `%` substitution specifiers or VNMR parameters using `$` substitution specifiers.

Percent sign (`%`) substitution specifier is used to scan for the text specified by keyword between the first percent sign in the template string and the next percent sign. The text specified by the keyword between the `%` substitution specifiers is passed to `$path`.

The following percent substitutions (% keywords) for time and date are obtained from the system clock, not from the sample info file:

Keyword	*Format*	*Description*
`%DATE%`	`YYYYMMDD`	4-digit year, 2-digit month, 2-digit day
`%TIME%`	`HHMMSS`	2-digit hour, 2-digit minute, 2-digit second
`%YR%`	`YYYY`	4-digit year
`%YR2%`	`YY`	2-digit year
`%MO%`	`MM`	2-digit month
`%DAY%`	`DD`	2-digit day
`%HR%`	`HH`	2-digit hour
`%MIN%`	`MM`	2-digit month
`%SEC%`	`SS`	2-digit second

Dollar sign (`$`) substitution specifier is used with the `Svfname` command to interpreted a VNMR parameter and substitute the value of this parameter a suffix.

Numeric parameters are truncated and represented as a string with the form: `<optional string>parameter value<optional string>`. The `name_template`, `pw=$pw$usec`, with vnmr parameter `pw` having a value of 12.3 produces pw=12usec01 which is appended to `.fid` (or `.img`) and passed to `$path`.

String parameters cannot not contain any of the following characters: '', '!', '"', '$', '&', '\', '', '(', ')', '*', ';', '<', '>', '?', '\\', '[', ']', '^', '`', '{', '}', '|', ',', '\0'

A comma separated excluded suffix list appends a string based on the suffixes and excluded suffixes to the path. Using the keyword `'replacespaces'` uses underscores (_) in place of spaces `' '` in the resulting path name. The keyword `'keepspaces'` retains spaces in the resulting path name.

'keepspaces'|'replacespaces' is an optional argument (includes quotes) that uses either of the following keywords: replacespaces or keepspaces. The argument is accepted if the third argument is a list of suffixes. The action is the same as described for the third argument

Version number is specified by %Rn% where n is an integer from 0 to 9 (default 2), as follows:

n=	*Description*
0	no revision digits are appended (all names must be uniquely constructed without these revision digits).
1 to **9**	revision number is padded with leading zeroes to form an n-digit number. If more places are needed than specified, more zeroes are used.
>9 (more than one digit)	Rnn is still used as a search string in the samp-leinfo file. %Rn% must be specified at the end of the name_template string. The revision digits are always appended except if %R0% is used.
no %Rn%	default of %R2% is used

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:
- autoname — Determines path for data storage during an automation run (C)
- autoname — Temple determining the path where is data stored (P)
- sqname — Study queue parameter template (P)
- svfname — Specifies the filename template (P)

svfname — Filename parameter template for non-study data ((P)

Description: Specifies the filename template where data is saved when not using a study in VnmrJ. The template is constructed using the same keywords and delimiter, dollar sign ($) and percent sign (%), as autoname.

Examples: If svfdir=userdir+'/data', the result from fidsave is:

```
svfname='$pslabel$_$tn$_' -> userdir+'/data/
Proton_H1_01.fid'
svfname='%DATE%/t%TIME%%R0%' -> userdir+'/data/
20040501/t113005.fid'
```

See also: *NMR Spectroscopy User Guide, VnmrJ Walkup*

Related:
- fidsave — Save data (M)
- Svfname — Create path for data storage (C)
- sqname — Study queue parameter template (P)
- save — Save data (M)
- svfname — Filename parameter template for non-study data ((P)

svp — Save parameters from current experiment (M)

Syntax: `svp(file) <(file<,'force'><,'nodb'>)>`

Description: Saves parameters from current experiment to a file. The parameter set can be retrieved with the rtp and rt macros. svp reflects any changes made in parameters up to the moment of entering svp, including acquisition parameters (unlike macro svf).

Arguments: file is the name of the file, with the suffix .par added, to be created to save the parameters. The default is the system prompts for a file name. You are warned if you attempt to overwrite a parameter set that already exists.

If `force` is given, you are not warned and the older parameter set is removed.

`nodb` is a keyword to prevent `svp` from adding information to a database. This prevention is useful if temporary parameter files are saved that will soon be removed.

Examples:
```
svp('/vnmr/stdpar/P31')
svp('/usr/george/testdata')
```

See also: *NMR Spectroscopy User Guide*

Related:

`rt`	Retrieve FID (M)
`rtp`	Retrieve parameters (M)
`svf`	Save FIDs in current experiment (M)

svs — Save shim coil settings (C)

Syntax: `svs(file)<:status>`

Description: Saves all shim coil settings except Z0 to a file.

Arguments: `file` is the name of a file for saving the shim coil settings. If the file name is an absolute path, `svs` uses it with no modifications. Otherwise, `svs` saves the shim in the first application directory for which it has write permission.

The `svs` command reports where it stored the shims, unless it is requested to return the status.

`status` is a return variable with one of the following values after `svs` finishes:

- 0 indicates `svs` failed to store shim file.
- 1 indicates `svs` stored the shim file, either as an absolute path or in the `shims` directory of the first application directory.
- >=2 indicates `svs` stored the file in `shims` directory of the second, third, or later application directory.

Examples:
```
svs('acetone')
svs('bb10mm'):r1
```

See also: *NMR Spectroscopy User Guide*

Related:

`rts`	Retrieve shim coil settings (C)

svs — Spin simulation vertical scale (P)

Description: Vertical scale for simulated spectrum.

Values: 0 to 1e10. A typical value is 200.

See also: *NMR Spectroscopy User Guide*

Related:

`spins`	Perform spin simulation calculation (C)
`spsm`	Enter spin system (M)

svtmp — Move experiment data into experiment subfile (M)

Syntax: `svtmp<(file)>`

Description: Moves the experiment data (parameters, FID, and transformed spectrum) from current experiment into a subdirectory inside `curexp+'/subexp'`. Unlike the macro `cptmp`, the experiment data is no longer accessible in the current experiment; only a copy of the parameters is still present.

Arguments: `file` is the name of the subfile that receives the experiment data. The default name is either the transmitter nucleus (if `seqfil='s2pul'`) or the pulse sequence name.

Examples:
```
svtmp
svtmp('cosy')
```

See also: *NMR Spectroscopy User Guide*

Related:

cptmp	Copy experiment data into experiment subfile (M)
curexp	Current experiment directory (P)
rttmp	Retrieve experiment data from experiment subfile (M)
seqfil	Pulse sequence name (P)

sw — Spectral width in directly detected dimension (P)

Description: Sets the total width of the spectrum to be acquired, from one end to the other. All spectra are acquired using quadrature detection. The spectral width determines the sampling rate for data, which occurs at a rate of `2*sw` points per second (actually `sw` pairs of complex points per second). Note that the sampling rate itself is not entered, either directly or as its inverse (known on some systems as the *dwell time*).

If a value of `sw` is entered whose inverse is not an even multiple of the time base listed above, `sw` is automatically adjusted to a slightly different value to give an acceptable sampling rate.

To enter a value in ppm, append the character `p` (e.g., `sw=200p`).

If a DSP facility is present in the system (i.e., `dsp='i'` or `dsp='r'`) and oversampling in the experiment has not been turned off by setting `oversamp='n'`, then the oversampling factor will be recalculated.

Values: Number, in Hz. The range possible is based on the system:

100 Hz to 500 kHz.

solids systems: up to 5 MHz.

See also: *NMR Spectroscopy User Guide*

Related:

dp	Double precision (P)
dsp	Type of DSP for data acquisition (P)
oversamp	Oversampling factor for acquisition (P)
setlp0	Set parameters for zero linear phase (M)
sw1	Spectral width in 1st indirectly detected dimension (P)
sw2	Spectral width in 2nd indirectly detected dimension (P)
sw3	Spectral width in 3rd indirectly detected dimension (P)

sw1 — Spectral width in 1st indirectly detected dimension (P)

Description: Analogous to the `sw` parameter except that `sw1` applies to the first indirectly detected dimension of a multidimensional data set. The increment of the variable evolution time `d2` is automatically calculated from `sw1`. The number of increments for this dimension is set by `ni`. To create `sw1` in the current experiment, as well as `ni` and `phase`, enter `addpar('2d')`.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
d2	Incremented delay in 1st indirectly detected dimension (P)
ni	Number of increments in 1st indirectly detected dimension (P)
phase	Phase selection (P)
sw	Spectral width in directly detected dimension (P)
sw2	Spectral width in 2nd indirectly detected dimension (P)
sw3	Spectral width in 3rd indirectly detected dimension (P)

sw2 — Spectral width in 2nd indirectly detected dimension (P)

Description: Analogous to the sw parameter except that sw2 applies to the second indirectly detected dimension of a multidimensional data set. The increment of the variable evolution time d3 is automatically calculated from sw2. The number of increments for this dimension is set by ni2. To create sw2 in the current experiment, as well as d3, ni2, and phase2, enter addpar('3d').

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
d3	Incremented delay for 2nd indirectly detected dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
phase2	Phase selection for 3D acquisition (P)
sw	Spectral width in directly detected dimension (P)
sw1	Spectral width in 2nd indirectly detected dimension (P)
sw3	Spectral width in 3rd indirectly detected dimension (P)

sw3 — Spectral width in 3rd indirectly detected dimension (P)

Description: Analogous to the sw parameter except that sw3 applies to the third indirectly detected dimension of a multidimensional data set. The increment of the variable evolution time d4 is automatically calculated from sw3. The number of increments for this dimension is set by ni3. To create sw3 in the current experiment, as well as d4, ni3, and phase3, enter addpar('4d').

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
d4	Incremented delay for 3rd indirectly detected dimension (P)
ni3	Number of increments in 3rd indirectly detected dimension (P)
par4d	Create 4D acquisition parameters (C)
phase3	Phase selection for 4D acquisition (P)
sw	Spectral width in directly detected dimension (P)
sw1	Spectral width in 1st indirectly detected dimension (P)
sw2	Spectral width in 2nd indirectly detected dimension (P)

sysgcoil — System gradient coil (P)

Description: Specially reserved string parameter that specifies which physical gradient set is currently installed, and allows convenient updating of important gradient characteristics when one gradient set is interchanged for another. The value to sysgcoil is assigned to the parameter gcoil when joining experiments or retrieving parameter sets.

This parameter is set in the Spectrometer Configuration window to the name of the gradient set in use. Once set, it is then available to all experiments and to all users.

See also: *VnmrJ Installation and Administration*; *VnmrJ Imaging NMR*

Related:

config	Display current configuration and possibly change it (M)
gcoil	Current gradient coil (P)
gmax	Maximum gradient strength (P)
setgcoil	Assign sysgcoil configuration parameter (M)

system — System type (P)

Description: A global parameter that sets the basic type of system: spectrometer or data station. The value is set using the System Type label in the Spectrometer Configuration window.

Values: `'spectrometer'` is a spectrometer system (Spectrometer choice in Spectrometer Configuration window).

`'datastation'` is a system used as a data station (Data Station choice in Spectrometer Configuration window). Acquisition is not allowed in this setting.

See also: *VnmrJ Installation and Administration*

Related:

`config`	Display current configuration and possibly change it (M)
`Console`	System console type (P)

`systemdir` VnmrJ system directory (P)

Description: Contains path to VnmrJ system directory, typically `/vnmr`. The UNIX environmental variable `vnmrsystem` initializes `systemdir` at bootup.

See also: *NMR Spectroscopy User Guide*

T

t1	T_1 exponential analysis (M)
t1s	T_1 exponential analysis with short output table (M)
t2	T_2 exponential analysis (M)
t2s	T_2 exponential analysis with short output table (M)
tabc	Convert data in table order to linear order (M)
tan	Find tangent value of an angle (C)
tape	Read tapes from VXR-style system (M,U)
tape	Control tape options of files program (P)
tchan	RF channel number used for tuning (P)
tcl	Send Tcl script to Tcl version of dg window (C)
temp	Open the Temperature Control window (C)
temp	Sample temperature (P)
tempcal	Temperature calculation (C)
tempcalc	Measure approximate sample temperature in Cold Probes (M)
testacquire	Test acquire mode (P)
testct	Check ct for resuming signal-to-noise testing (M)
testsn	Test signal-to-noise of a spectrum (M)
teststr	Find which array matches a string M)
text	Display text or set new text for current experiment (C)
textis	Return the current text display status (C)
textvi	Edit text file of current experiment (M)
th	Threshold (P)
th2d	Threshold for integrating peaks in 2D spectra (P)
thadj	Adjust threshold for peak printout (M)
time	Display experiment time or recalculate number of transients (M)
tin	Temperature interlock (P)
tlt	First-order baseline correction (P)
tmove	Left-shift FID to time-domain cursor (M)
tmsref	Reference 1D proton or carbon spectrum to TMS (M)
tn	Nucleus for observe transmitter (P)
tncosyps	Set up parameters for TNCOSYPS pulse sequence (M)
tndqcosy	Set up parameters for TNDQCOSY pulse sequence (M)
tnmqcosy	Set up parameters for TNMQCOSY pulse sequence (M)
tnnoesy	Set up parameters for TNNOESY pulse sequence (M)
tnroesy	Set up parameters for TNROESY pulse sequence (M)
tntocsy	Set up parameters for TNTOCSY pulse sequence (M)
Tocsy	Convert the parameters to a TOCSY experiment (M)
Tocsy1d	Convert the parameter set to a Tocsy1d experiment (M)
tocsyHT	Set up the tocsyHT experiment (M)
tof	Frequency offset for observe transmitter (P)
tpwr	Observe transmitter power level with linear amplifiers (P)
tpwrf	Observe transmitter fine power (P)
tpwrm	Observe transmitter linear modulator power (P)

trace	Mode for *n*-dimensional data display (P)
traymax	Sample changer tray slots (P)
troesy	Set up parameters for TROESY pulse sequence (M)
trunc	Truncate real numbers (O)
tshift	Adjust tau2 to current cursor position (M)
tugain	Amount of receiver gain used by qtune (P)
tune	Assign a frequency to a channel for probe tuning (C)
tunehf	Tune both H1 and F19 on an HFX probe (M)
tunematch	Default match target, in percent of optimum (P)
tunemethod	Method to use for tuning (P)
tuneResult	Message indicating how well the tuning succeeded (P)
tunesw	Width of the tuning sweep in Hz (P
tupwr	Transmitter power used in tuning (P)
typeof	Return identifier for argument type (O)

t1 — T_1 exponential analysis (M)

Description: Processes data obtained using an array of values of the parameter d2 for a T_1 experiment. It runs expfit, which does an exponential curve fitting that determines the value of T_1. The output is matched to the equation:

```
M(t)=(M(0)-M0)*exp(-t/T1)+M0
```

where *M0* is the equilibrium Z magnetization and *M(0)* is the magnetization at time zero (e.g., immediately after the 180° pulse for an inversion recovery T_1 experiment). Notice that this equation will fit inversion recovery data (for which *M(0)* is approximately equal to *–M0*) or saturation recovery data (for which *M(0)* is 0).

The required input is the file fp.out from fp and the values of the arrayed parameter. The T_1 analysis is done for all the peaks listed in fp.out. Peaks are selected for analysis by entering fp(index1,index2,...) before running the analysis. The output file is the analyze.list in the current experiment. The file analyze.out is used by exp1 to display the results. The output of the analysis program shows T_1 and its standard deviation, but does not explicitly show *M(0)*, *M0*, or their standard deviations. The *M(0)* and *M0* values can be found in "raw" form in analyze.out in the current experiment, but their standard deviations are not part of the program output.

See also: *NMR Spectroscopy User Guide*

Related:

d2	Incremented delay in 1st indirectly detected dimension (P)
expfit	Make least squares fit to polynomial or exponential curve (C)
fp	Find peak heights (C)
t1s	T_1 exponential analysis with short output table (M)
t2	T_2 exponential analysis (M)
t2s	T_2 exponential analysis with short output fable (M)

t1s — T_1 exponential analysis with short output table (M)

Description: Performs the same analysis as t1 but produces a short output table showing only a summary of the measured relaxation times.

See also: *NMR Spectroscopy User Guide*

Related:

t1	T_1 exponential analysis (M)

t2 — T_2 exponential analysis (M)

Description: Processes data obtained using an array of values for the base time parameter `bt` for a T_2 experiment. It runs `expfit`, which does an exponential curve fitting that determines the value of T_2. The output is matched to the equation:

$M(t) = (M(0) - M(inf))*exp(-t/T2) + M(inf)$

where *M(0)* is the magnetization at time zero (i.e., the full magnetization excited by the observe pulse) and *M(inf)* is the xy-magnetization at infinite time (zero unless the peak is sitting on an offset baseline).

The required input is the file `fp.out` from `fp` and the values of the arrayed parameter. The T_2 analysis is done for all the peaks listed in `fp.out`. Peaks are selected for analysis by entering `fp(index1,index2,...)` before running the analysis. The output file is the file `analyze.list` in the current experiment. The file `analyze.out` is used by `exp1` to display the results. The output of the analysis program shows T_2 and its standard deviation, but does not explicitly show *M(0)*, *M(inf)*, or their standard deviations. The *M(0)* and *M(inf)* values can be found in "raw" form in `analyze.out` in the current experiment, but their standard deviations are not part of the program output.

See also: *NMR Spectroscopy User Guide*

Related:

`expfit`	Make least squares fit to polynomial or exponential curve (C)
`fp`	Find peak heights (C)
`t1`	T_1 exponential analysis (M)
`t1s`	T_1 exponential analysis with short output table (M)
`t2s`	T_2 exponential analysis with short output fable (M)

t2s — T_2 exponential analysis with short output table (M)

Description: Performs the same analysis as `t2` but produces a short output table showing only a summary of the measured relaxation times.

See also: *NMR Spectroscopy User Guide*

Related:

`t2`	T_2 exponential analysis (M)

tabc — Convert data in table order to linear order (M)

Syntax: `tabc<(dimension)>`

Description: Converts arbitrarily ordered data obtained under control of an external AP table to linear monotonic order, suitable for processing in VnmrJ. The data must have been acquired according to a table in the `tablib` directory.

Imaging and other 2D experiments are normally acquired so that the order of the incremented acquisition parameter, such as the phase-encode gradient, is linear and monotonic. For a standard imaging experiment, this linear order means that the phase-encode gradient progresses from a starting negative value monotonically up through zero to a positive value (e.g., –64, –63, –62, ... , –1, 0, 1, ... , 62, 63). The `ft2d` program assumes this structure in its operation.

Data from table-driven 2D pulse sequences is used by entering `tabc` *only once* before normal 2D processing and/or parameter storage. In this situation, `tabc` takes no arguments and is executed by entering `tabc` in the command window. A simple check is done by `tabc` to prevent it from being executed more than once on the same data set.

2D data is expected to be in the standard VnmrJ format, but if the 2D data is in the compressed format, setting `dimension` to `1` converts the data. `tabc` supports all 2D data types recognized by VnmrJ: arrayed, compressed multislice, and arrayed compressed multislice,

3D data is expected to be in the compressed/standard format, in which there are `ni` standard 2D planes of data (the third dimension), each consisting of `nf` compressed FIDs (the second dimension). Setting `dimension` to `3` reorders 3D data acquired with an external table.

`tabc` reads the file `fid` in the `acqfil` subdirectory of the current experiment. Before the data is reordered, this file is written to the file `fid.orig` in the same `acqfil` directory. If for any reason `tabc` fails or results in an unpredictable or undesired transformation, the original raw data can be recovered by moving `fid.orig` back to `fid`. To gain more disk space, you can delete `fid.orig` after you are satisfied that conversion is successful.

Use `tabc` on saved data that has been loaded into an experiment or on data in an experiment that has just been acquired but not yet saved. In the first case, converted data must be resaved for the saved data set to reflect conversion.

`tabc` requires that data must have the same number of "traces" as the table elements. It does not support any of the advanced features of table expansion (e.g., the entire table must be explicitly listed in the table file), and expects to find only one table in a file; whether the table is t1 or t60 is unimportant.

Arguments: `dimension` specifies the type of data to be converted: `1` for 2D compressed data, `2` for 2D standard data, or `3` for 3D compressed/standard data. The default is 2.

Examples:
```
tabc
tabc(1)
tabc(3)
```

See also: *VnmrJ Imaging NMR*

Related:

`flashc`	Convert compressed 2D data to standard 2D format (C)
`ft2d`	Fourier transform 2D data (C)
`ni`	Number of increments in 1st indirectly detected dimension (P)
`nf`	Number of FIDs (P)

`tan` Find tangent value of an angle (C)

Syntax: `tan(angle)<:n>`

Description: Finds the tangent of an angle.

Arguments: `angle` is an angle, in radians.

`n` is the return value giving the tangent of `angle`. The default is to display the tangent value in the status window.

Examples:
```
tan(.5)
tan(val):tan_val
```

See also: *User Programming*

Related:

`atan`	Find arc tangent value of a number (C)
`cos`	Find cosine value of an angle (C)
`exp`	Find exponential value of a number (C)
`ln`	Find natural logarithm of a number (C)
`sin`	Find sine value of an angle (C)

`tape` Read tapes from VXR-style system (M,U)

Syntax: (From VnmrJ) `tape(<-d device,><type,>option <,file1,file2,...>)`
(From UNIX) `tape <-d device> <type> <option> <file1> <file2>...`

Description: Displays the contents of a VXR-style (Gemini, VXR-4000, or XL) 9-track tape for use with VnmrJ or reads one or several files from the tape into the current directory. Note that the *write* option is not supported (i.e., VnmrJ only *reads* tapes in a VXR-style format and does not write to a tape).

Arguments: `device` is the tape drive device name. The default value is `/dev/rst8`. For AIX systems, `device` should be `/dev/rmt0`. If the default value is not set properly or another device name is wanted, be sure to type `-d` and a space before the device name you want to input.

`type` is the type of tape to be accessed. `'-q'` or `'-s'` select the 1/4-inch tape unit ("streaming" or cartridge tape); this is the default. `'-9'`, `'-h'`, or `'-n'` select the 1/2- inch tape unit (open reel tape drive).

`option` is one of the following:

- `'help'` is a keyword to display help on the use of the system.
- `'cat'` is a keyword to display a catalog of files on tape.
- `'read'` is a keyword to read one or more files. This option requires that the files be listed as the next argument.
- `'rewind'` is a keyword to rewind tape (1/2-inch tape only).
- `'quit'` is a keyword to release the tape drive (1/2-inch tape only).

`file1, file2, ...` are the names of one or more files to be read. Wildcard characters (`*` and `?`) can be used.

Examples:
```
tape('cat')
tape('-h','read','mydata')
tape -h read mydata
tape -d /dev/rmt/0lb read mydata
```

Related:

`decomp`	Decompose a VXR-style directory (C)
`vxr_unix`	Convert VXR-style text files to UNIX format (M,U)

`tape` Control tape options of files program (P)

Description: Defines device that `files` program accesses when it is instructed to read or write to a tape. The parameter `tape` is in the user's global parameter tree.

Values: Name of a device. The default device is `/dev/rst8`. If `tape` does not exist or is set to the null string (two single quotes with no space between), `files` uses its default device value. Notice that different computers define tape drives differently. For VnmrSGI, `tape='/dev/tapens'` is appropriate. For Solaris, `tape='/dev/rmt/0mb'`.

Related:

`files`	Interactively handle files (C)

`tchan` RF channel number used for tuning (P)

Description: Set by the protune macro.

See also: *NMR Spectroscopy User Guide*

Related:

`protune`	Macro to start ProTune (M)
`atune`	ProTune Present (P)
`mtune`	Tune probe using swept-tune graphical display (M)
`tugain`	Receiver gain used in tuning (P)
`tunesw`	Width of the tuning sweep in Hz (P
`tupwr`	Transmitter power used in tuning (P)

T

tcl — Send Tcl script to Tcl version of dg window (C)

Syntax: `tcl(script)`

Description: Sends a Tcl (Tool Command Language) script to the Tcl version of the dg window. If this window is not active, this command does nothing.

Arguments: `script` is any legal Tcl script.

See also: *User Programming*

Related:

dg	Display group of acquisition/processing parameters (C)

temp — Open the Temperature Control window (C)

Applicability: Systems with a variable temperature (VT) controller.

Description: Opens the Temperature Control window, which has the following capabilities:

- Turn temperature control off.
- Set temperature control on at a specified temperature in degrees C.
- Enable temperature control from within an experiment using the temp parameter and the su, go, ga, or au macros. This mode is the default.
- Alternatively, turn off experiment control of the temperature and allow only the Temperature Control window (and sethw) to set the temperature. This mode has the advantage that, often times, temp is different between experiments. Joining a different experiment and entering go can unexpectedly change the temperature. This mode prevents this problem.
- Resetting the temperature controller when the temperature cable is reconnected to a probe.

See also: *NMR Spectroscopy User Guide*

Related:

acqi	Interactive acquisition display process (C)
au	Submit experiment to acquisition and process data (M)
ga	Submit experiment to acquisition and FT the result (M)
go	Submit experiment to acquisition (M)
readhw	Read current values of acquisition hardware (C)
sethw	Set values for hardware in acquisition system (C)
su	Submit a setup experiment to acquisition (M)
temp	Sample temperature (P)
tin	Temperature interlock (P)

temp — Sample temperature (P)

Applicability: Systems with a variable temperature (VT) module.

Description: Sets the temperature of sample.

Values: `'n'` or `-150` to `+200`, in steps of 0.1°C. `'n'` instructs the acquisition system not to change the VT controller and to ignore temperature regulation throughout the course of the experiment.

See also: *NMR Spectroscopy User Guide*

Related:

readhw	Read current values of acquisition hardware (C)
temp	Open the Temperature Control window (C)
tempcal	Temperature calculation (C)
tin	Temperature interlock (P)
vtc	Variable temperature cutoff point (P)

tempcal — Temperature calculation (C)

Applicability: Systems with a variable temperature (VT) module.

Syntax: `tempcal(solvent)<:temperature>`

Description: For exact determination of sample temperature when using the VT unit, a temperature calibration curve must be made for each probe used. All data, such as gas flow, must be noted. Use samples of ethylene glycol for high-temperature calibration, and use samples of methanol for low-temperature calibration. To make the calculation:

- Bring the sample to the desired temperature and allow sufficient time for equilibration, then obtain a spectrum.
- Next, align two cursors on the two resonances in the spectrum, then enter `tempcal('e')` for ethylene glycol, or enter `tempcal('m')` for methanol. The temperature is calculated based on the difference frequency between the cursors.

Arguments: `solvent` is the sample solvent: `'glycol'`, `'e'`, or `'g'` for ethylene glycol, or `'methanol'` or `'m'` for methanol.

`temperature` returns the calculated value of the sample temperature. The default is the system displays the value.

Examples:
```
tempcal('glycol')
tempcal('m'):temp
```

See also: *NMR Spectroscopy User Guide*

tempcalc — Measure approximate sample temperature in Cold Probes (M)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Measure the approximate sample temperature and the actual sample temperature gradient and generate a report. Requires a ~1% HOD CH_3CN sample.

testacquire — Test acquire mode (P)

Description: Allows test acquisitions to be done while a study queue is active, without using the study queue. When this mode is enabled, acquisitions do not update the status of the currently loaded experiment in the study queue, and data is not saved in the study queue. This mode is set from the Test mode check box in the Acquisition menu or from the command line.

Syntax: `testacquire=<'y' or 'n'>`

Values:
`'y'` test acquire mode enabled
`'n'` test acquire mode disabled

Related:

`acquire`	Acquire data (M)
`save`	Save data (M)

testct — Check ct for resuming signal-to-noise testing (M)

Description: Used by the `testsn` macro to decide when to resume testing of signal-to-noise. See the description of `testsn` for details.

See also: *NMR Spectroscopy User Guide*

Related:

`ct`	Completed transients (P)
`testsn`	Test signal-to-noise of a spectrum (M)

testsn — Test signal-to-noise of a spectrum (M)

Description: Part of the automatic periodic signal-to-noise testing that occurs during various automated acquisitions, most notably c13. Transforms the data using fn=16000, and then baseline corrects, setting the left-most 10% of the spectrum and the right-most 2% as baseline. After the baseline correction, testsn uses getsn to calculate the signal-to-noise.

- If signal-to-noise exceeds the desired goal in parameter sn (found in the standard carbon parameter set /vnmr/stdpar/c13), testsn aborts the experiment using the command halt, which initiates processing according to the wexp parameter.
- If signal-to-noise is not reached, testsn estimates the signal-to-noise ratio at the end of the experiment. If signal-to-noise target will not be reached by then, it cancels subsequent signal-to-noise testing, but allows the experiment to proceed.
- If the signal-to-noise target will be reached before the end of the experiment, it saves the estimated number of transients required to reach the goal in the parameter r7 (using a conservative estimate), and then sets the processing at future blocks to be only testct, which simply tests if ct is greater than r7, and, if so, resumes testing of signal-to-noise with testsn.

See also: *NMR Spectroscopy User Guide*

Related:

c13	Automated carbon acquisition (M)
fn	Fourier number in directly detected dimension (P)
getsn	Get signal-to-noise estimate of a spectrum (M)
halt	Abort acquisition with no error (C)
r1–r7	Real parameter storage for macros (P)
sn	Signal-to-noise ratio (P)
testct	Check ct for resuming signal-to-noise testing (M)
wexp	Specify action when experiment completes (C)

teststr — Find which array matches a string M)

Syntax: `teststr(parameter,string <,tree>):$ret`

Description: The teststr command requires at least two arguments. The first is the name of a string parameter. The first argument must generally be enclosed in single quotes. The teststr command needs the name of the parameter, not its values. The second is a string. The optional third argument is the parameter tree. The default is current.

Macro parameters can be used as the first argument. In this case, the third argument must be 'local'.

This command sets $ret to the index of the array element that matches the second argument. If none of the array values of the parameter match the second argument, a zero is returned.

Examples:

```
n1='hello','labas','gidday','hola','bonjour','ciao'
teststr('n1','labas'):r1
```

sets r1=2, since 'labas' matches element 2 of the n1 array.

The elements do not need to be single words. For example,

```
n1='good night','labanaktis','bonne nuit','gute
Nacht','boa noite','buonas noces'
teststr('n1','boa noite'):r1
```

sets r1=5. The strings must match exactly, including upper and lower case

```
teststr('n1','gute nacht'):r1
```
sets `r1=0`, since the lower case n in nacht does not match the upper case N in Nacht.

For local dollar variables, the `'local'` argument must be used. Again, enclose the name of the local parameter in single quotes.

```
$greet='hello','labas','gidday','hola', 'ciao'
teststr('$greet','labas','local'):r1
```

text — Display text or set new text for current experiment (C)

Syntax: `text<(text_string)><:string_variable>`

Description: Associated with each experiment is a text file, consisting of a block of text, that can be used to describe the sample and experiment. `text` allows displaying the text file and changing the text file for the current experiment. A UNIX text editor, such as `vi`, or the macro `textvi` can also be used to edit the text file of the current experiment.

Arguments: `text_string` is a string of text that replaces the existing text file. The default is to display the text file in the current experiment. The characters `\\` or `\n` can be used in the string to denote a new line, and the characters `\t` can be used to denote a tab (see example below).

`string_variable` returns the text in `text_string` as a string variable. Thus, for example, the `text:n1` and `text(n1+'cosy experiment')` commands, where `n1` is a string, can be used in a macro to add a "cosy experiment" to the text. An equivalent operation using the `atext` command would be `atext('cosy experiment')`.

Examples:
```
text('Sample 101\tCDCl3\\13 February')
```

See also: *NMR Spectroscopy User Guide*

Related:

`atext`	Append string to the current experiment text (M)
`ctext`	Clear the text of the current experiment (C)
`curexp`	Current experiment directory (P)
`dtext`	Display a text file in the graphics window (C)
`puttxt`	Put text file into another file (C)
`textvi`	Edit text file of current experiment (M)
`vnmrprint`	Print text files (U)

textis — Return the current text display status (C)

Syntax:
(1) `textis(command):$yes_no`
(2) `textis:$display_command`

Description: Determines if a command given by the user currently controls the text window (syntax 1) or returns the name of the command currently controlling the text window (syntax 2).

Arguments: `command` is the name of a command that potentially may be controlling the text window.

`$yes_no` returns `1` if `command` controls the text window, or `0` if it does not.

`$display_command` returns the name of the command currently controlling the text window.

Examples:
```
textis:$display
if ($display = 'dg') then . . . endif
```

See also: *User Programming*

Related:

`graphis`	Return the current graphics display status (C)

textvi — Edit text file of current experiment (M)

Description: Edits the text file of the current experiment using the UNIX text editor `vi`. `textvi` is equivalent to the command `vi(curexp+'/text')`.

See also: *NMR Spectroscopy User Guide*

Related:

`edit`	Edit a file with user-selectable editor (M)
`text`	Display text or set new text for current experiment (C)
`vi`	Edit text file with `vi` editor (M)

th — Threshold (P)

Description: Sets threshold for printout of peak frequencies so that peaks greater than `th` on the plot appear on any peak listings. `th` is always bipolar (i.e., negative peaks greater in magnitude than `th` also appear in peak listings).

Values: 0 to 1e9, in mm.

See also: *NMR Spectroscopy User Guide*

Related:

`thadj`	Adjust threshold for peak printout (M)

th2d — Threshold for integrating peaks in 2D spectra (P)

Description: Used by `ll2d` when determining the bounds of a peak and calculating its volume. To create the 2D peak picking parameters `th2d` and `xdiag` in the current experiment, enter `addpar('ll2d')`.

Values: From `0.0` to `1.0`. If `th2d=1.0`, `ll2d` integrates all points in the peak that are above the current threshold for the spectrum (i.e., the portion of the peak that can be seen in a contour plot of the spectrum). A smaller value causes `ll2d` to integrate a larger area when determining the volume of a peak. If `th2d=0.5`, for example, `ll2d` integrates all points in a peak that are above 0.5 times the current threshold.

See also: *NMR Spectroscopy User Guide*

Related:

`addpar`	Add selected parameters to the current experiment (M)
`ll2d`	Automatic and interactive 2D peak picking (C)
`xdiag`	Threshold for excluding diagonal peaks when peak picking (P)

thadj — Adjust threshold for peak printout (M)

Syntax: `thadj<(max_peaks<,noise_mult<,llarg1<,llarg2>>>)>`

Description: Adjusts the threshold `th` so that no more than a specified maximum number of peaks are found in a subsequent line listing (see `nll`) and so that `th` is at least a specified noise multiplier times the root-mean-square noise level.

Arguments: `max_peaks` is the maximum number of peaks in the displayed spectral range. The default is `wc/4` (i.e., the threshold is adjusted such that `ppf` will produce a “reasonable” number of lines with any width of plot).

`noise_mult` is a noise multiplier used to calculate the minimum value for `th` from the size of the root-mean-square noise.

`llarg1` is the `noise_mult` argument (the default is 3) to the `nll` command used inside this macro

`llarg2` is the keyword argument (`'pos'`, `'neg'`, `'all'`; the default is `'all'`.) to the `nll` command used inside this macro.

Examples:

```
thadj
thadj(50)
thadj(200,4)
```

```
thadj(200,4,2)
thadj(200,4,2,'pos')
```

See also: *NMR Spectroscopy User Guide*

Related:

nll	Find line frequencies and intensities (C)
ppf	Plot teak frequencies over spectrum (M)
th	Threshold (P)
vsadj	Automatic vertical scale adjustment (M)
vsadj2	Automatic vertical scale adjustment by powers of two (M)
vsadjc	Automatic vertical scale adjustment for ^{13}C spectra (M)
vsadjh	Automatic vertical scale adjustment for ^{1}H spectra (M)
wc	Width of chart (P)

time — Display experiment time or recalculate number of transients (M)

Syntax: `time<(<hours,>minutes)>`

Description: Estimates the acquisition time or recalculates the number of transients so that the total acquisition time is approximately the requested time. The parameters looked at when calculating the time per transient are d1, d2, d3, at, ni, sw1, ni2, and sw2.

Arguments: `hours` and `minutes` are numbers making up a time to be used by the system to recalculate the parameter nt so that the total acquisition time is approximately the time requested; the default (no arguments) is for the system to estimate the acquisition time for a 1D, 2D, or 3D experiment using the parameters in the current experiment.

Examples:

```
time
time(2,45)
```

See also: *NMR Spectroscopy User Guide*

Related:

at	Acquisition time (P)
d1	First delay (P)
d2	Incremented delay in 1st indirectly detected dimension (P)
d3	Incremented delay in 2nd indirectly detected dimension (P)
exptime	Display experiment time (C)
ni	Number of increments in 1st indirectly detected dimension (P)
ni2	Number of increments in 2nd indirectly detected dimension (P)
nt	Number of transients (P)
sw1	Spectral width in 1st indirectly detected dimension (P)
sw2	Spectral width in 2nd indirectly detected dimension (P)

tin — Temperature interlock (P)

Description: Controls error handling based on temperature regulation. If temperature regulation is lost, `tin` can be used to select whether an error is generated and acquisition is halted or whether a warning is generated and acquisition continues. In both cases, the lost regulation will cause werr processing to occur, thus providing a user-selectable mechanism to respond to VT failure.

Values: `'n'` turns off the temperature interlock feature

`'w'` indicates the variable temperature regulation light is monitored during the course of the experiment and, if it starts to flash (regulation lost), a warning is generated; however, acquisition is not stopped.

`'y'` indicates the variable temperature regulation light is monitored during the course of the experiment and, if it starts to flash (regulation lost), the current

data acquisition is stopped. The acquisition will not resume automatically if regulation is regained.

See also: *NMR Spectroscopy User Guide*

Related:
- `in` — Lock and spin interlock (P)
- `werr` — When error (P)

tlt — First-order baseline correction (P)

Description: When spectral display is active, the command `dc` turns on a linear drift correction (baseline correction). The result of this operation includes calculating a first-order baseline correction parameter `tlt`. The calculation is made by averaging of a small number of points at either end of the display and drawing a straight line baseline between them.

See also: *NMR Spectroscopy User Guide*

Related:
- `cdc` — Cancel drift correction (C)
- `dc` — Calculate spectral drift correction (C)
- `lvl` — Zero-order baseline correction (P)

tmove — Left-shift FID to time-domain cursor (M)

Description: Provides an alternative method of left shifting time-domain data. To use this method, position the right time cursor at the place that should be the start of the FID, then enter `tmove`. This adjusts `lsfid` to left-shift the FID.

See also: *NMR Spectroscopy User Guide*

Related:
- `lsfid` — Number of complex points to left-shift *np* FID (P)

tmsref — Reference 1D proton or carbon spectrum to TMS (M)

Syntax: `tmsref:tms_found`

Description: Tries to locate a TMS line. If found, `tmsref` re-references the spectrum to the TMS line and returns a 1 to the calling macro; if not found, `tmsref` returns 0 and the referencing is left as it was. In the case of other signals (e.g., from silicon grease) immediately to the left of the TMS line (even if they are higher than the reference line), `tmsref` tries avoiding those by taking the rightmost line in that area, as long as it is at least 10% of the main Si-CH_3 signal. Large signals within 0.6 ppm for ^{1}H (or 6 ppm for ^{13}C) to the right of TMS may lead to misreferencing.

Arguments: `tms_found` returns 1 if a TMS line was located or returns 0 if not.

See also: *NMR Spectroscopy User Guide*

Related:
- `c13` — Automated carbon acquisition (M)
- `h1` — Automated proton acquisition (M)

tn — Nucleus for observe transmitter (P)

Description: Changing the value of `tn` causes a macro (`_tn`) to be executed that extracts values for `sfrq` and `tof` from lookup tables. The tables, stored in the directory `/vnmr/nuctables`, are coded by atomic weights.

Values: In the lookup tables, typically given by `'H1'`, `'C13'`, `'P31'`, etc. The value `tn='lk'` sets the deuterium frequency, and also holds the lock current and switches the relay in the automated deuterium gradient shimming module, if present, so that deuterium signal may be observed without disturbing lock. The frequency is the same as `tn='H2'`.

See also: *NMR Spectroscopy User Guide*

Related:

`dn`	Nucleus for first decoupler (P)
`dn2`	Nucleus for second decoupler (P)
`dn3`	Nucleus for third decoupler (P)
`sfrq`	Transmitter frequency of observe nucleus (P)
`tof`	Frequency offset for observe transmitter (P)

`tncosyps` Set up parameters for TNCOSYPS pulse sequence (M)

Description: Sets up a homonuclear correlation experiment (phase-sensitive version) with water suppression.

See also: *NMR Spectroscopy User Guide*

`tndqcosy` Set up parameters for TNDQCOSY pulse sequence (M)

Applicability: Systems with a linear amplifier on the observe channel and a T/R switch.

Description: Sets up a 2D J-correlation experiment with water suppression.

See also: *NMR Spectroscopy User Guide*

`tnmqcosy` Set up parameters for TNMQCOSY pulse sequence (M)

Applicability: Systems with hardware digital phaseshifter for transmitting with direct-synthesis rf; otherwise, software small-angle phaseshifter for transmitting with the old-style rf is used.

Description: Sets up a multiple-quantum filtered COSY experiment with water suppression.

See also: *NMR Spectroscopy User Guide*

`tnnoesy` Set up parameters for TNNOESY pulse sequence (M)

Applicability: Systems with a linear amplifier on the observe channel and a T/R switch.

Description: Sets up a 2D cross-relaxation experiment with water suppression.

See also: *NMR Spectroscopy User Guide*

`tnroesy` Set up parameters for TNROESY pulse sequence (M)

Description: Sets up a rotating-frame NOE experiment with water suppression.

See also: *NMR Spectroscopy User Guide*

`tntocsy` Set up parameters for TNTOCSY pulse sequence (M)

Applicability: Systems with T/R switch, computer-controlled attenuators, and linear amplifiers on observe channel.

Description: Sets up a total-correlation spectroscopy experiment (HOHAHA) with water suppression.

See also: *NMR Spectroscopy User Guide*

`Tocsy` Convert the parameters to a TOCSY experiment (M)

Description: Convert parameters to a TOCSY experiment.

See also: *NMR Spectroscopy User Guide*

Related:

ft1dac	Combined arrayed 2D FID matrices (M)
ft2dac	Combined arrayed 2D FID matrices (M)
wft1dac	Combined arrayed 2D FID matrices (M)
wft2dac	Combined arrayed 2D FID matrices (M)

Tocsy1d — Convert the parameter set to a Tocsy1d experiment (M)

Description: Convert the parameter set to a Tocsy1d experiment.

See also: *NMR Spectroscopy User Guide*

Related:

Proton	Set up parameters for ^{1}H experiment (M).
sel1d	Selective 1D protocols to set up (M).

tocsyHT — Set up the tocsyHT experiment (M)

Description: Sets up parameters for a Hadamard-encoded tocsy experiment.

See also: *NMR Spectroscopy User Guide*

Related:

htofs1	Hadamard offset in ni (P)
fn1	Fourier number in 1st indirectly detected dimension (P)
ni	Number of increments in 1st indirectly detected dimension (P)
ft2d	Fourier transform 2D data (C)
sethtfrq1	Set Hadamard frequency list from a line list (M)
Tocsy	Set up parameters for a TOCSY pulse sequence (M)
htfrq1	Hadamard frequency list in ni (P)

tof — Frequency offset for observe transmitter (P)

Description: Controls the exact positioning of the transmitter. As the value assigned to tof increases, the transmitter moves to a higher frequency (toward the left side of the spectrum). The minimum step size of tof is determined by the type of rf hardware in the spectrometer. The limit is specified using the Step Size label in the Spectrometer Configuration window. Systems with broadband style rf (rftype='b') generally have 100-Hz resolution; all other systems have 0.1 Hz resolution.

Values: Approximate, depends on frequency–100000 to 100000, in Hz.

See also: *NMR Spectroscopy User Guide*

Related:

config	Determine current configuration and possibly change it (M)
dof	Frequency offset for first decoupler (P)
dof2	Frequency offset for second decoupler (P)
dof3	Frequency offset for third decoupler (P)
rftype	Type of rf generation (P)

tpwr — Observe transmitter power level with linear amplifiers (P)

Applicability: Systems with a linear amplifier on the observe channel.

Description: Controls transmitter power. The value of the attenuator upper safety limit is set using the Upper Limit label in the Spectrometer Configuration window. Depending on hardware adjustments, the system may saturate at a given value of tpwr (i.e., values above a certain value may give equal output).

Values: On systems with 63-dB attenuator installed: 0 to 63 (63 is maximum power), in units of dB. About 55 to 60 is normal. Lower values (e.g., 49) might be used for water suppression experiments like 1-3-3-1.

On systems with 79-dB attenuator installed: –16 to 63 (63 is maximum power), in units of dB.

CAUTION: **Continuous power greater than 2 watts in a switchable probe will damage the probe. Always carefully calibrate power to avoid exceeding 2 watts. The maximum value for tpwr on a 200-MHz, 300-MHz, or 400-MHz system with a linear amplifier on the decoupler channel has been set to 49, corresponding to about 2 watts of power. Before using tpwr=49 for continuous decoupling, ensure safe operation by measuring the output power. This should be done during system installation and checked periodically by the user.**

See also: *NMR Spectroscopy User Guide*

Related:

`cattn`	Coarse attenuator (P)
`config`	Determine current configuration and possibly change it (M)
`dpwr`	Power level for first decoupler with linear amplifiers (P)
`dpwr2`	Power level for second decoupler (P)
`dpwr3`	Power level for third decoupler (P)
`dpwrf`	First decoupler fine power (P)
`fattn`	Fine attenuator (P)
`tpwrf`	Observe transmitter fine power (P)

`tpwrf` Observe transmitter fine power (P)

Applicability: Systems with a fine attenuator on the observe transmitter channel.

Description: Controls the transmitter fine attenuator. Systems with this attenuator are designated using the Fine Attenuator label in the Spectrometer Configuration window. The fine attenuator is linear and spans 60 dB or 6 dB. If `tpwrf` is not present, enter `create('tpwrf','integer')` `setlimit('tpwrf',4095,0,1)` to create it.

Values: 0 to 4095, where 4095 is maximum power. If `tpwrf` does not exist in the parameter table, a value of 4095 is assumed.

See also: *NMR Spectroscopy User Guide*

Related:

`config`	Determine current configuration and possibly change it (M)
`dpwr`	Power level for first decoupler with linear amplifiers (P)
`dpwrf`	First decoupler fine power (P)
`fattn`	Fine attenuator (P)
`tpwr`	Observe transmitter power level with linear amplifier (P)
`tpwrm`	Observe transmitter linear modulator power (P)

`tpwrm` Observe transmitter linear modulator power (P)

Description: Controls the power level on the observe transmitter linear modulator. The fine power control is linear and spans 0 to `tpwr`.

Values: 0 to 4095, where 4095 is maximum power. If `tpwrm` does not exist in the parameter table, a value of 4095 is assumed.

See also: *NMR Spectroscopy User Guide*

Related:

`config`	Determine current configuration and possibly change it (M)
`dpwrf`	First decoupler fine power (P)
`fattn`	Fine attenuator (P)

`trace` Mode for *n*-dimensional data display (P)

Description: Sets the multidimensional data display mode.

Values: `'f1'` displays the f_1 axis horizontally and allows f_1 traces to be displayed.

`'f2'` displays the f_2 axis horizontally and allows f2 traces to be displayed.

`'f3'` displays the f3 axis horizontally and allows f_3 traces to be displayed if the data set is 3D.

See also: *NMR Spectroscopy User Guide*

`traymax` Sample changer tray slots (P)

Applicability: Systems with an automatic sample changer.

Description: Specifies the type of sample changer. It also can be used to disable the sample changer. The value is set using the Sample Changer label in the Spectrometer Configuration window.

Values: 0 is setting for no sample changer present or, if a sample changer is attached, to disable the changer (None choice in the Spectrometer Configuration window).

9, 50, 100, 96, 48 are `traymax` values that indicate the number of sample slots for the corresponding sample changer (9 is for Carousel, 50 is for SMS/ASM 50 Sample, 100 is for SMS/ASM 100 Sample, 96 is for VAST, and 48 is for NMS, 768 for 768AS).

See also: *VnmrJ Installation and Administration; VnmrJ Walkup*

Related:

`config`	Display current configuration and possibly change it (M)

`troesy` Set up parameters for TROESY pulse sequence (M)

Description: Sets up parameters for the transverse cross-relaxation experiment in a rotating frame.

See also: *NMR Spectroscopy User Guide*

`trunc` Truncate real numbers (O)

Description: In MAGICAL programming, an operator that truncates real numbers.

Examples:

```
$3 = trunc(3.6)
```

See also: *User Programming*

Related:

`acos`	Find arc cosine of number (C)
`asin`	Find arc sine of number (C)
`atan`	Find arc tangent of a number (C)
`cos`	Find cosine value of an angle (C)
`exp`	Find exponential value (C)
`ln`	Find natural logarithm of a number (C)
`tan`	Find tangent value of an angle (C)
`sqrt`	Return square root of a real number (O)
`typeof`	Return identifier for argument type (O)

`tshift` Adjust tau2 to current cursor position (M)

Applicability: Systems with a solids module.

Description: Adjusts `tau2` to make the current time cursor position the start of acquisition. As the time-domain cursor can move between points, this macro allows the accurate adjustment of `tau2` so as to start another acquisition exactly at the top of an echo.

See also: *User Guide: Solid-State NMR*

tugain — Receiver gain used in tuning (P)

Description: Used internally by the protune macro to set the receiver gain.

See also: *NMR Spectroscopy User Guide*

Related:

protune	Macro to start ProTune (M)
atune	ProTune Present (P)
mtune	Tune probe using swept-tune graphical display (M)
tchan	RF channel number used for tuning (P)
tunematch	Default match target, in percent of optimum (P)
tunesw	Width of the tuning sweep in Hz (P
tupwr	Transmitter power used in tuning (P)

tune — Assign a frequency to a channel for probe tuning (C)

Syntax: (1) `tune(freq1,<freq2,freq3,freq4>)`
(2) `tune(chan1,freq1,<chan2,freq2,...>)`

Description: Assigns a frequency to a channel when tuning the probe. The frequency assignment remains in effect (as a tune frequency) until the next `su` or `go` command is executed. Although only the first synthesizer is connected to the tuning system, the console is programmed to set this synthesizer to the desired frequency based on the channel shown on the CHAN readout on the TUNE INTERFACE unit.

The `tune` program has two formats. If syntax 1 is used, frequencies are assigned to channels based on the order of the arguments. The first argument is interpreted and assigned to the first (observe) channel, the second argument is assigned to the second (decoupler) channel. A third or fourth argument would be interpreted and assigned in a similar manner.

If syntax 2 is used, the arguments are entered in pairs, with the first argument specifying the rf channel and the next argument specifying the frequency.

`tune` selects the format based on the first argument. If the first argument is a name for an rf channel, syntax 2 is assumed; otherwise, syntax 1 is used.

Arguments: `freq1`, `freq2`, `freq3`, and `freq4` specify the frequency of the rf channel as a value in MHz (e.g., `200` or `300`) or indirectly using the nucleus for tuning the probe (e.g., `'H1'` or `'C13'`). If a nucleus is entered, it must be found in the nucleus table. The frequency of any channel without an argument is unaffected. For example, `tune('H1','C13','N15')` sets the first channel to tune at the ^{1}H, the second channel at ^{13}C, and the third channel at ^{15}N. If a fourth channel is present, it is not affected. Entering `tune('H1','C13',200)` assigns the same frequencies for the first and second channels but the third channel tunes to 200 MHz, regardless of the proton frequency.

`chan1`, `chan2`, `chan3`, and `chan4` specify the channel directly:

- `'todev'` or `'ch1'` specify channel 1 (observe transmitter).
- `'dodev'` or `'ch2'` specify channel 2 (first decoupler).
- `'do2dev'` or `'ch3'` specify channel 3 (second decoupler).
- `'do3dev'` or `'ch4'` specify channel 4 (third decoupler).

Only one of these keywords is used per channel (do not enter the channel using just its number). If a channel does not have a keyword entered as an argument, that channel is not affected (e.g., `tune('ch4','P31')` selects the frequency corresponding to ^{31}P on the fourth channel, but leaves the first three channels unaffected).

Examples:

```
tune('H1','C13','N15')
tune('H1','C13',200)
tune('ch4','P31')
```

See also: *NMR Spectroscopy User Guide*

Related:

dfrq	Transmitter frequency of first decoupler (P)
dfrq2	Transmitter frequency of second decoupler (P)
dfrq3	Transmitter frequency of third decoupler (P)
go	Submit experiment to acquisition (C)
mtune	Tune probe using swept-tune graphical display (M)
qtune	Tune probe using swept-tune graphical tool (C)
sfrq	Transmitter frequency of observe nucleus (P)
spcfrq	Display frequencies of rf channels (M)
su	Submit a setup experiment to acquisition (C)
tune	Assign frequencies (C)

tunehf — Tune both H1 and F19 on an HFX probe (M)

Syntax: `tunehf<('x')>`

Description: Tune both H1 and F19 on an HFX probe. Including the optional argument, `tunehf('x')` also tunes the low band channel to `dn` (`dfrq`).

Arguments: `'x'`— low band channel to `dn` (`dfrq`)

See also: *NMR Spectroscopy User Guide*

Related:

protune	Macro to start ProTune (M)

tunematch — Default match target, in percent of optimum (P)

Description: The default match target, in percent of optimum. This local real parameter must be created. It is used as the match criterion in calls of the form `protune(599.96)`

See also: *NMR Spectroscopy User Guide* and *VnmrJ Walkup*

Related:

protune	Macro to start ProTune (M)
create	Create new parameter in a parameter tree (C)
atune	ProTune Present (P)
mtune	Tune probe using swept-tune graphical display (M)
tchan	RF channel number used for tuning (P)
tugain	Receiver gain used in tuning (P)
tunesw	Width of the tuning sweep in Hz (P
tupwr	Transmitter power used in tuning (P)

tunemethod — Method to use for tuning (P)

Applicability: Liquids, VnmrJ Walkup, Automation

Description: Specify probe tuning method. Methods are located in:
`$home/vnmrsys/tune/methods` for local user or
`/vnmr/tune/methods` for access by all users.
The method determines the nucleus to tune and how coarse or fine the probe is tuned as a percentage of the optimal `pw`.

Values: `'lohi'` –tune low band to medium criterion then tune high band to medium criterion

`'<name>'` – user defined method.

See also: *NMR Spectroscopy User Guide* and *VnmrJ Walkup*

Related:

atune	ProTune Present (P)
protune	Macro to start ProTune (M)
wtune	Specify when to tune (P)

tuneResult — Message indicating how well the tuning succeeded (P)

Description: Message indicating how well the tuning succeeded. This local string parameter is created by ProTune and set to a string describing the result of the tuning. The first word of the message will be "ok" if tuning is successful, "failed" if it fails, and "Warning:" if tuning was not done but the experiment should proceed.

See also: *NMR Spectroscopy User Guide* and *VnmrJ Walkup*

Related:		
	protune	Macro to start ProTune (M)

tunesw — Width of the tuning sweep in Hz (P)

Description: Sets the width of the tuning sweep in Hz and is set by the protune macro.

See also: *NMR Spectroscopy User Guide* and *VnmrJ Walkup*

Related:		
	protune	Macro to start ProTune (M)
	atune	ProTune Present (P)
	mtune	Tune probe using swept-tune graphical display (M)
	tchan	RF channel number used for tuning (P)
	tugain	Receiver gain used in tuning (P)
	tunematch	Default match target, in percent of optimum (P)
	tupwr	Transmitter power used in tuning (P)

tupwr — Transmitter power used in tuning (P)

Description: The transmitter power used in tuning. The aptune pulse sequence uses this to set the transmitter power. Set by the protune macro.

See also: *NMR Spectroscopy User Guide* and *VnmrJ Walkup*

Related:		
	protune	Macro to start ProTune (M)
	atune	ProTune Present (P)
	mtune	Tune probe using swept-tune graphical display (M)
	tchan	RF channel number used for tuning (P)
	tugain	Receiver gain used in tuning (P)
	tunematch	Default match target, in percent of optimum (P)
	tunesw	Width of the tuning sweep in Hz (P

typeof — Return identifier for argument type (O)

Syntax: typeof

Description: In MAGICAL programming, an operator that returns an identifier (0 or 1) for the type (real or string) of an argument.

Examples:
```
if typeof('$1') then $arg=1 else $arg=$1 endif
```

See also: *User Programming*

Related		
	isreal	Utility macro to determine a parameter type (M)
	isstring	Utility macro to determine a parameter type (M)
	on	Make a parameter active or test its state (C)
	size	Return number of elements in an arrayed parameter (O)

U

ultra8	Selects the Ultra 8 shim configuration (M)
ultra18	Selects the Ultra 18 shim configuration (M)
undospins	Restore spin system as before last iterative run (M)
undosy	Restore original 1D NMR data from sub experiment (M)
unit	Define conversion units (C)
unlock	Remove inactive lock and join experiment (C)
updatepars	Update all parameter sets saved in a directory (M)
updateprobe	Update probe file (M)
updaterev	Update after installing new VnmrJ version (M)
updtgcoil	Update gradient coil (M)
updtparam	Update specified acquisition parameters (C)
usemark	Use “mark” output as deconvolution starting point (M)
userdir	VnmrJ user directory (P)
usergo	Experiment setup macro called by go, ga, and au (M)
userfixpar	Macro called by fixpar (M)

ultra8 selects the Ultra 8 shim configuration (M)

Syntax: `ultra8`

Description: The `ultra8` macro selects the Ultra 8 shim configuration and selects an appropriate template for the `dgs` command and manual shim panel.

Administrator privilege is required to change the shim configuration. The shims are: `z1c z2c x1 y1 xz yz xy x2y2`.

Related: `ultra18` selects the Ultra 18 shim configuration (M)

ultra18 Select 18 shim configuration for Ultra 18 shim power supply (M)

Syntax: `ultra18`

Description: Selects the 18 shim configuration for the Ultra 18 shim power supply and selects an appropriate template for the `dgs` command and manual shim panel. Administrator privilege is required to change the shim configuration.

The shims are: `z1 z1c z2 z2c z3c z4c x1 y1 xz yz xy x2y2 x3 y3 xz2 yz2 zxy zx2y2`

Related: `ultra8` selects the Ultra 8 shim configuration (M)

undospins Restore spin system as before last iterative run (M)

Description: Returns the values of the line assignments and the chemical shifts and coupling constants existing before the last iterative adjustment with `spins('iterate')`, and then runs `spins`. The parameters are returned from the file `spini.inpar` and the transitions from the file `spini.savela` in the current experiment.

See also: *NMR Spectroscopy User Guide*

Related: `spins` Perform spin simulation calculation (C)

undosy — Restore original 1D NMR data from sub experiment (M)

Description: Restores the 1D DOSY data stored by the `dosy` macro (if data exists) by recalling the data stored in the file `subexp/dosy2Ddisplay` in the current experiment. `undosy` and `redosy` enable easy switching between the 1D DOSY data (spectra as a function of `gzlvl1`) and the 2D DOSY display (signal as a function of frequency and diffusion coefficient).

See also: *NMR Spectroscopy User Guide*

Related: `dosy` Process DOSY experiments (M)
`redosy` Restore 2D DOSY display from subexperiment (M)

unit — Define conversion units (C)

Syntax:
```
unit<(suffix,label,m<,tree><,'mult'|'div'>    \
   ,b<,tree><,'add'|'sub'>)>
```

Description: Defines a linear relationship that can be used to enter parameters with units. The unit is applied as a suffix to the numerical value (e.g., `10k`, `100p`). The definition of the linear relations follows the traditional `y=mx+b` equation, where `x` is the input value and `y` is the converted result.

Entering the `unit` command with no arguments displays all currently defined units. To remove a unit, define the unit with a 0 for the slope.

A convenient place to put `unit` commands for all users is in the `bootup` macro. Put private `unit` commands in a user's `login` macro.

Arguments: `suffix` is a string identifying the name for the unit. The length of the string is limited to 12 characters.

`label` is a string for the name to be displayed when the `axis` parameter is set to the value of the suffix (if the suffix is only a single character). The length of the string is limited to 12 characters.

`m` is the slope of the linear relationship, defined either as a numerical value or as the name of a parameter. If a parameter name is used, it may be optionally followed with the parameter tree to use (argument `tree`) and by another optional keyword that specifies whether the parameter value should be a multiplier (keyword `'mult'`) or divisor (keyword `'div'`).

`tree` is the parameter tree to use (i.e.,`'current'`, `'processed'`, `'global'`, or `'systemglobal'`). The default tree is `'current'`.

`'mult'` is a keyword that specifies that a parameter value used for the slope should be a multiplier. This is the default for the slope.

`'div'` is a keyword that specifies that a parameter value used for the slope should be a divisor.

`b` is the intercept of the linear relationship, defined either as a numerical value or as the name of a parameter. If a parameter name is used, it may be optionally followed with the parameter tree to use (argument `tree`) and by another optional keyword that specifies whether the parameter value should be added (keyword `'add'`) or subtracted (keyword `'sub'`).

`'add'` is a keyword that specifies that a parameter value used for the intercept should be a added. This is the default for the intercept.

`'sub'` is a keyword that specifies that a parameter value used for the intercept should be a subtract.

Examples: `unit`
Displays all currently defined units

`unit('k','kHz',1000)`
`r1=10k` will set `r1` to `10000`

`unit('p','ppm','reffrq','processed')`
`r1=10p` will set `r1` to `10*reffrq`, where `reffrq` from processed tree

`unit('p','',0)`
`r1=10p` will set `r1` to `10` and give an error "`unknown unit p`"

`unit('F','degF',5/9,-32*5/9)`
`r1=212F` will set `r1` to `100` (degrees C)

`unit('C','degC',9/5,32)`
`r1=100C` will set `r1` to `212` (degrees F)

See also: *NMR Spectroscopy User Guide*, *User Programming*

Related:
- `axis` — Axis label for displays and plots (P)
- `bootup` — Macro executed automatically when VnmrJ is activated (M)

`unlock` — Remove inactive lock and join experiment (C)

Syntax: `unlock(exp_number,'force')`

Description: In attempting to join another experiment, the `jexp` command may abort claiming the experiment is locked. This feature prevents two users from processing the same experimental data at the same time, which could corrupt the data (a "user" can also be a background operation invoked by the same user, such as in `wexp` processing). This lock can be left behind if the program or the computer crashes.

The `unlock` command removes the lock if it is inactive and joins the unlocked experiment. The command will fail if the lock is still active (i.e., the process that made the lock is still executing) or if the lock was placed on the experiment by a remote host. The latter situation can only occur when one or more nodes are sharing the same file system (and experimental data).

Arguments: `exp_number` is the number of the experiment from 1 to 9 to be unlocked.

`force` unlocks an experiment under all circumstances and joins the unlocked experiment.

Examples: `unlock(3)`

See also: *NMR Spectroscopy User Guide*

Related:
- `jexp` — Join existing experiment (C)

`updatepars` — Update all parameter sets saved in a directory (M)

Syntax: `updatepars(directory)`

Description: Corrects saved parameter sets. Starting with VNMR version 4.2, all parameters, upper limit, lower limit, and step sizes have been tightened. Further additions were made in VNMR 4.3. `updatepars` searches a directory for parameter and FID files and corrects the `procpar` files found. This macro overwrites parameters in the current experiment. The corrections applied to the parameter sets are defined by the `parfix` macro. Because `updatepars` uses the current experiment to process the parameter sets, the experiment chosen for running `updatepars` should not contain a valuable data set.

Arguments: `directory` is the name of the directory to be searched.

Examples:
`updatepars('myparlib')`
`updatepars('mydata')`

See also: *NMR Spectroscopy User Guide*

Related:
- `parfix` Update parameter sets (M)
- `parversion` Version of parameter set (P)

`updateprobe` Update probe file (M)

Syntax: `updateprobe(<probe|'tmplt'><,'system'>)`

Description: Updates the current existing probe file or probe template.

Arguments: `probe` is the probe parameter to update. The default is the current probe parameter value.

`'tmplt'` is a keyword to update the local probe template. The default is the current probe file.

`'system'` is a keyword to update the system template or probe file, providing you have write permission to the file. The default is to update the local template or probe file.

Examples:
```
updateprobe
updateprobe('autosw')
updateprobe('autosw','system')
updateprobe('tmplt')
```

See also: *NMR Spectroscopy User Guide*

Related:
- `addparams` Add parameter to current probe file (M)
- `getparam` Receive parameter from probe file (M)
- `setparams` Write parameter to current probe file (M)

`updaterev` Update after installing new VnmrJ version (M)

Description: Updates experiment parameters and the global file following installation of a new VNMR software version. `updaterev` is called by the `makeuser` command during the installation process.

See also: *VnmrJ Installation and Administration*

`updtgcoil` Update gradient coil (M)

Applicability: Systems with three-axis gradients.

Description: Creates the `gcoil` parameter, if it does not exist, and sets it to the current value of the system gradient coil `sysgcoil`. `updtgcoil` only executes if gradients are configured in the system.

The `updtgcoil` macro is called when a new experiment is joined or new parameters are read into an experiment; however, it is only called at these times if the `gcoil` parameter exists. If `sysgcoil` is set to a gradient table name and if the values of `sysgcoil` and `gcoil` are different, a message is displayed in the Status window to let the user know that the gradient coil parameters have been updated.

`updtgcoil` can be called directly if the user wants to update the parameter set with the `gcoil` and gradient table parameters.

See also: *NMR Spectroscopy User Guide; User Programming; VnmrJ Imaging NMR*

Related:
- `gcoil` Read data from gradient calibration tables (P)
- `sysgcoil` System gradient coil (P)

`updtparam` Update specified acquisition parameters (C)

Description: Enables interactive updating of specified acquisition parameters.

See also: *SpinCAD*

Related:		
	psgupdateoff	Prevent update of acquisition parameters (C)
	psgupdateon	Enable update of acquisition parameters (C)

usemark — Use "mark" output as deconvolution starting point (M)

Description: In some cases it is not possible to produce a line list that is a suitable starting point for a deconvolution (e.g., lines may overlap so severely that a line list does not find them). In this case, or in any case, the results of a "mark" operation during a previous spectral display (ds) may be used to provide a starting point. If the "mark" has been made with a single cursor, the information in the file mark1d.out contains only a frequency and intensity, and the starting linewidth is taken from the parameter slw.

If the "mark" is made with two cursors, placed symmetrically about the center of each line at the half-height point, mark1d.out contains two frequencies and an intensity. In this case, the starting frequency is taken as the average of the two cursor positions; the starting linewidth is taken as their difference (thus allowing different starting linewidths for each line).

See also: *NMR Spectroscopy User Guide*

Related:		
	ds	Display a spectrum (C)
	slw	Spin simulation linewidth (P)

userdir — VnmrJ user directory (P)

Description: Stores the full UNIX path of the directory that contains a user's private VnmrJ files. These include a user's private maclib, menulib, shims, psglib, experiments, etc. This parameter is initialized at bootup by the UNIX environmental variable vnmruser.

Values: Typical value is /home/vnmr2/vnmrsys

See also: *NMR Spectroscopy User Guide*

Related:		
	curexp	Current experiment directory (P)
	systemdir	VnmrJ system directory (P)

usergo — Experiment setup macro called by go, ga, and au (M)

Description: Called by macros go, ga, or au before starting an experiment. The user typically creates usergo as a means to set up general experiment conditions.

See also: *NMR Spectroscopy User Guide*

Related:		
	au	Submit experiment to acquisition and process data (M)
	ga	Submit experiment to ac acquisition and FT the result (M)
	go	Submit experiment to acquisition (M)
	go_	Pulse sequence setup macro called by go, ga, and au (M)

userfixpar — Macro called by fixpar (M)

Description: Called by the macro fixpar to provide an easy mechanism to customize parameter sets.

See also: *NMR Spectroscopy User Guide*

Related:		
	fixpar	Correct parameter characteristics in experiment (M)

V

vast1d	Set up initial parameters for VAST experiments (M)
vastget	Selects and displays VAST spectra (M)
vastglue	Assemble 1D datasets into a 2D (or pseudo-2D) datasets (M)
vastglue2	Assemble 1D datasets into a 2D (or pseudo-2D) datasets (M)
vastgo	Turn off LC stop flow automation, start VAST automation (M)
vbg	Run VNMR processing in background (U)
vf	Vertical scale of FID (P)
vi	Edit text file with vi text editor (M)
vibradd	Display relative amplitudes of Cold Probe vibrations (M)
vjhelp	Display VnmrJ help (U)
vn	Start VNMR directly (U)
vnmr	Start VNMR in current windowing system (U)
vnmr2sc	VNMR to SpinCAD pulse sequence translator (M)
vnmr_accounting	Open Accounting window (U)
vnmrexit	Exit from the VNMR system (C)
vnmrj	Start VnmrJ (U)
vnmrjcmd()	Commands to invoke the GUI popup (C)
vnmrplot	Plot files (U)
vnmrprint	Print text files (U)
vo	Vertical offset (P)
vp	Vertical position of spectrum (P)
vpaction	Set initial state for multiple viewports (M)
vpf	Current vertical position of FID (P)
vpfi	Current vertical position of imaginary FID (P)
vpset3def	Set the viewport state to three default viewports (M)
vpsetup	Set new viewports (M)
vs	Vertical scale (P)
vs2d	Vertical scale for 2D displays (P)
vsadj	Automatic vertical scale adjustment (M)
vsadj2	Automatic vertical scale adjustment by powers of 2 (M)
vsadjc	Automatic vertical scale adjustment for ^{13}C spectra (M)
vsadjh	Automatic vertical scale adjustment for ^{1}H spectra (M)
vsproj	Vertical scale for projections and traces (P)
vtairflow	Variable Temperature Air Flow (P)
vtairlimits	Variable Temperature Air Flow Limits (P)
vtc	Variable temperature cutoff point (P)
vtcomplvl	Variable temperature compensation for gradient shimming (P)
vttype	Variable temperature controller present (P)
vtwait	Variable temperature wait time (P)
vxr_unix	Convert VXR-style text files to UNIX format (M,U)

V

vast1d — **Set up initial parameters for VAST experiments (M)**

Applicability: Systems with VAST accessory.

Description: Sets up initial VAST parameters from the `/vnmr/stdpar` directory or from the user's `stdpar` directory if the appropriate file exists there. Any changes made to the files in these directories are reflected in the setup. The file `/vnmr/stdpar/vast1d.par` contains the "default" parameters for VAST spectra and should be modified as needed to produce spectra under desirable conditions. After running `vast1d`, the solvent parameter can be set by choosing it from the list of solvents listed in `/vnmr/solvents`.

See also: *NMR Spectroscopy User Guide*

vastget — **Selects and displays VAST spectra (M)**

Applicability: Systems with VAST accessory.

Syntax: `vastget(<well>,<well>, ...)>`

Description: Selects and displays the spectra from any arbitrary well or wells using the well label(s) as arguments. the spectra are displayed in a `dss` stacked plot.

Arguments: `well` is the well label from which you want to select and display spectra. The wells are labeled [A->H][1-8].

Examples: `vastget('B6','B7','C11','G3')`

See also: *NMR Spectroscopy User Guide*

vastglue — **Assemble 1D datasets into a 2D (or pseudo-2D) datasets (M)**

Applicability: Systems with the VAST accessory.

Syntax: `vastglue(<rack,<zone>)`

`vastglue(<glue order>,<plate>)`

Description: Used to artificially reconstruct a 2D datasets from a series of 1D data sets having similar filenames. It is crucial to ensure that the format of the file names of each of the 1D data sets is identical. `vastglue` reads in each 1D file, in succession, and adds it to the previous data, but in a 2D format. It assumes that file names are of the format obtained when using the default setting of `autoname` (`autoname=''`). If `autoname` has been redefined, use a macro like `vastglue2`. Save the resulting reconstructed 2D datasets in the normal manner using `svf`.

Arguments: `rack` is the rack number; the default is 1. If you enter a `rack` number, you must also enter a `zone` number.

`zone` is the zone number; the default is 1. If you want to specify a `zone` number, you must enter a `rack` number.

`glue order` is the specific glue order to be defined based on the order defined in a `plate_glue` file. If `glue order` is specified, you can provide a `plate` number as the second argument and used with the `glue order` argument.

See also: *NMR Spectroscopy User Guide*

Related:

`autoname`	Prefix for automation data file (P)
`vastglue2`	Assemble related 1D datasets into a 2D (or pseudo-2D) datasets (M)

vastglue2 — **Assemble 1D datasets into a 2D (or pseudo-2D) datasets (M)**

Applicability: Systems with the VAST accessory

Syntax: `vastglue2<(number)>`

Description: Used to artificially reconstruct a 2D data set from a series of 1D datasets having similar filenames. It is crucial to ensure that the format of the file names of each of the 1D datasets is identical. `vastglue2` reads in each 1D file, in succession, and adds it to the previous data, but in a 2D format. It assumes that file names are of the format obtained using a nondefault setting of `autoname` (`autoname='filename_R%RACK:%_Z%ZONE:%_S%SAMPLE#:%_'`). This definition must be hard coded into the macro by the user. If `autoname` has not been redefined, use a macro like `vastglue`. Save the resulting reconstructed 2D data set in the normal manner using `svf`.

Arguments: `number` is used to specify that only spectra from 1 through `number` are to be glued. The default is to glue all the spectra stored in the current directory that have the proper file name format (from 1 through `arraydim`).

See also: *NMR Spectroscopy User Guide*

Related:

`autoname`	Prerix for automation data file (P)
`vastglue`	Assemble related 1D datasets into a 2D (or pseudo-2D) data set (M)

`vastgo` Turn off LC stop flow automation, start VAST automation (M)

Applicability: Systems with the LC-NMR and VAST accessory

Description: Turns off LC stopped flow use of automation and starts VAST automation run.

`vbg` Run VNMR processing in background (U)

Syntax: (From UNIX) `vbg exp_number command_string <prefix>`

Description: Enables user to perform VNMR tasks in the background. `vbg` (for "VNMR background processing") must be run from within a UNIX shell, and *no* foreground or other background processes can be active in the designated experiment (e.g., if you are working in `exp2` in VNMR (in the foreground), you cannot execute background processing in `exp2` as well).

Foreground processing causes a lock file to be placed in the appropriate experiment. The file has a format such as `f.1268`, where `1268` indicates the process number in the process table (accessed in UNIX by entering the command `ps -e`). Background processing causes a lock file to be in the appropriate experiment as well. This file has a format such as `b.4356`, where `4356` indicates the process number. By displaying the files within an experiment, the user can readily determine whether any foreground or background processes are active in that experiment.

Arguments: `exp_number` is the number of the experiment, from 1 to 9, in the user's directory in which the background processing is to take place.

`command_string` is the command string to be executed by VNMR in the background. Double quotes enclosing the string are mandatory (e.g., `"fn=4096 fn1=2048 wft2da"`).

`prefix` is a prefix to be added to the name of the log file, making the name `prefix_bgf.log`. The default name is `exp_number_bgf.log`, where `exp_number` is the experiment number. The log file is placed in the experiment in which the background processing takes place.

Examples: (From UNIX) `vbg 1 "wft2da bc('f1')"`
(From UNIX) `vbg 3 "vsadj pl pscale pap page" plotlog`

See also: *User Programming*

V

vf — Vertical scale of FID (P)

Description: In normalized intensity (nm) mode, vf is the height of the largest FID. In absolute intensity (ai) mode, vf is a multiplier that is adjusted to produce a desired vertical scale, using the appearance on the display screen as a guide (full scale on the screen gives full scale on the plotter).

vf can be entered in the usual way or interactively controlled by clicking the middle mouse button in the graphics window during a FID display (click above the FID to increase vf or below the FID to decrease it).

Values: 1e–6 to 1e9, in mm (in nm mode) or as a multiplier (in ai mode).

See also: *NMR Spectroscopy User Guide*

Related:

ai	Select absolute intensity mode (C)
df	Display a single FID (C)
nm	Select normalized intensity mode (C)
sf	Start of FID (P)
wf	Width of FID (P)

vi — Edit text file with vi text editor (M)

Syntax: vi(file)

Description: Invokes the UNIX text editor vi for editing the file name given. On the Sun workstation, a popup screen contains the editing window. On the GraphOn terminal, the main screen becomes the editing window. vi is a powerful text editor, but its user interface is limited: the mouse is not used, menus are not available, and status information is virtually nonexistent.

vi operates in three modes: the *command mode* (for moving the cursor and editing text), the *insert mode* (for inserting text into the file), and the *last line mode* (for special operations). Each mode is described below.

Command mode

vi starts up in the command mode. In this mode, user commands consist mostly of a single character, sometimes in combination with another character, or a number, or both. A number preceding a command typically defines how many times a command should be executed (e.g., 3dd means delete three lines). The commands available include the following:

G	go to the start of the last line in the file
3G	go to the start of line 3
0	(zero) go to the start of the current line
$	go to the end of the current line
Return or +	go to start of next line
-	(hyphen) go to start of previous line
Ctrl-d	scroll down (forward) half a screen
Ctrl-f	scroll forward by a full screen
Ctrl-u	scroll up (back) half a screen
Ctrl-b	scroll back by a full screen
/expression	find next expression and jump to its first character
?expression	find previous expression, jump to its first character
n	find next expression (from the last search)
N	find previous expression (from the last search)
dd	delete one line and put it into the buffer
3dd	delete three lines and put them into the buffer
dw	delete word

`x`	erase one character forward (under cursor)
`X`	erase one character backwards (before cursor)
`3x`	erase three characters forward
`rcharacter`	erase character and replace with `character`
`ZZ`	write if necessary and quit *vi*
`.`	(period) repeat the last command
`u`	undo the last command
`J`	join the next line to the current line
`yy` or `Y`	yank one line and put into a buffer (called yank buffer)
`p`	put contents of yank buffer after the cursor
`P`	put contents of yank buffer before the cursor
`"aY`	yank line into buffer `a` (buffers `b` to `z` also available)
`"ap`	put contents of buffer `a` below current line
`"aP`	put contents of buffer `a` above current line

Because there is no command line, these commands do not show up on the screen but are *executed immediately* (without pressing the Return key).

Insert mode

In the insert mode, characters typed on the keyboard (except for the Esc key) show up in the text. The insert mode is entered by typing one of the following commands from the command mode:

`a text` Esc	append `text` after the current cursor position
`A text` Esc	append `text` to the end of current line
`i text` Esc	insert `text` before current cursor position
`cw word` Esc	change `word` from current cursor position to end
`2cw words` Esc	change two `words` from current cursor position to end
`o text` Esc	open line below current line and append `text`
`O text` Esc	open line above current line and append `text`

The only way to exit the insert mode is by pressing the Esc key, which leads back to the command mode. Unfortunately, there is no indication on the screen whether `vi` is in the command mode or in the insert mode. Inexperienced users often press the Esc key to make sure they are still in the command mode. The Esc key can also be used to avoid execution of commands that have been typed partially (e.g., the number has been typed, but not the last character).

You can insert special (normally nondisplayable) characters into the text if they are preceded by a Ctrl-v (e.g., entering Ctrl-v Ctrl-q is displayed in the text as `^Q`).

Changing selected occurrences

The following actions find one or more occurrences of a particular word and change it to another word:

- First, type `/word` and press Return, where / is a forward slash and `word` is word you want to change.
- Next, press `n` as necessary until you reach the occurrence of the `word` you want to change.
- Finally, type `cw newword` and press Esc, where `newword` is replacement word.
- To repeat for another occurrence of `word`, press `n` as necessary to scan forward, and then type `.` (a period) to repeat `cw newword` (or whatever was the last change)

Changing selected occurrences of an expression (one or more words) is similar. To change two words, for example, take the same actions as above but use the command `2cw` (or `c2w`) instead.

Last line mode

The last line mode is initiated with a colon; thereafter, commands such as the following can be used (press Return to execute these commands):

`:r filename`	read file named `filename` (insert in currently open file)
`:w`	write (save) file
`:w filename`	write under a new file named `filename`
`:e filename`	edit a different file named `filename`
`:q`	quit `vi` (only possible if file has been written back)
`:wq`	write back file (save changes) and quit `vi`
`:q!`	quit `vi` without saving changes

Exiting from `vi` is accomplished by using the `ZZ` command in the command mode, or with the `:q`, `:wq`, or `:q!` commands in the last line mode.

This description lists only a selection of the most important commands. For more information on `vi`, refer to UNIX books and manuals.

Examples:
```
vi(userdir+'/psglib/apt.c')
vi(curexp+'/text')
```

See also: *User Programming*

Related:

`edit`	Edit a file with user-selectable editor (M)
`paramvi`	Edit a parameter and its attributes with `vi` text editor (M)
`macrovi`	Edit a user macro with the `vi` text editor (C)
`menuvi`	Edit a menu with the `vi` text editor (M)
`textvi`	Edit text file of current experiment (M

`vibradd` Display relative amplitudes of Cold Probe vibrations (M)

Applicability: Systems with Varian, Inc. Cold Probes

Description: Display the relative amplitudes of the vibrations reaching the probe. Requires a doped HOD sample.

`vjhelp` Display VnmrJ help (U)

Syntax: `vjhelp file:///vnmr/jhelp/jhelp.html`

Description: Displays the VnmrJ help in a Web browser.

`vn` Start VNMR directly (U)

Syntax: (From UNIX) `vn <-display Xserver> <-fn font> &`

Description: Starts the VNMR application directly without checking the operating system and attempting to run the window manager.

Arguments: `-display Xserver` specifies X server display (e.g., `hostname:0.0`). The default is the environment set by the `DISPLAY` variable.

`-fn font` specifies the size of the font displayed (e.g., `9x15`, `8x13`, or `7x13`). The default is the font set in the `.Xdefaults` file. Note that the size of the font affects the size of the VNMR window.

Examples:
```
vn &
vn -display hostname:0.0 &
vn -font 8x13 &
```

See also: *NMR Spectroscopy User Guide*

Related: vnmr Start VNMR (U)

vnmr — Starts VnmrJ (U)

Applicability: VnmrJ

Syntax: vnmr

Description: Starts the VnmrJ application

See also: *NMR Spectroscopy User Guide*

Related: vnmrj Start VnmrJ (U)

vnmr2sc — VNMR to SpinCAD pulse sequence translator (M)

Syntax: vnmr2sc<('sequence_name'<,rfchannels<,gradchannels>>)>

Description: Converts the pulse sequence pointed to by the seqfil parameter in the current VNMR parameter set from a C program into a SpinCAD pulse sequence. The conversion result is stored in the local spincad/psglib under the same name as the C pulse sequence (i.e., the name stored in the seqfil parameter), but without the .c extension.

vnmr2sc uses dps output to generate the SpinCAD code, i.e., the pulse sequence must be compiled and must be displayable with dps. Pulse sequences that do not compile with the dps option cannot be translated. For the same reason, vnmr2sc cannot translate features that do not show up in dps. This means that go-time decisions (such as flag-based C if constructs) will *not* show up in the translated SpinCAD sequence. In such cases, you have two options:

- Translate the sequence several times, once for each of the relevant flag settings. That is, generate several (simpler) SpinCAD pulse sequences from a single C sequence.
- Translate the sequence once (preferably with all options turned on), then manually insert the necessary if statements and other missing elements using SpinCAD.

Arguments: sequence_name is an optional argument that permits the name of the resulting SpinCAD pulse sequence to be specified. By default, vnmr2sc creates a SpinCAD sequence with the name specified in the seqfil parameter (i.e., the SpinCAD sequence has the same name as the C pulse sequence). sequence_name is particularly useful if a C sequence is to be translated into multiple SpinCAD sequences; see the examples.

rfchannels is an optional numeric argument specifying the number of rf channels. Use it when you want the SpinCAD sequence to address more rf channels. By default, vnmr2sc determines the number of rf channels from the source sequence. You can only *increase* the number of rf channels. If you specify 0 rf channels, the number of rf channels is left unchanged.

gradchannels is a second optional numeric argument specifying the number of gradient channels or axes. Use it when you want to convert a nongradient sequence to a gradient sequence or when you want the SpinCAD sequence to address more gradient axes than the source sequence. By default, vnmr2sc determines the number of gradient axes from the source sequence. You can only *increase*, not decrease, the number of gradient axes.

Examples:

```
vnmr2sc
setup('H1','CDCl3') hmqc null=0.2 vnmr2sc
null=0 mbond='y' vnmr2sc('hmbc')
```

```
vnmr2sc('gcosy',2,3)
nt=256 vnmr2sc
vnmr2sc(4,1)
vnmr2sc(0,1)
```

See also: *SpinCAD Manual*

Related:

dps	Display pulse sequence (C)
spincad	Run SpinCAD program (C)

vnmr_accounting Open Accounting window (U)

Description: Opens a window for creating and maintaining cost accounting data for groups of users on a spectrometer system. The program accommodates multiple rate schedules for spectrometer usage. A calendar tool can be used to define holidays for holiday rates. There is no limit on the number of rates that can be defined. Multiple printers can be selected.

Any user can view the accounting information (enter `cd /vnmr/bin` followed by `./vnmr_accounting`), but to update information, the user must have `root` privileges.

See also: *System Installation and Administration*

Related:

operator	Operator name (P)
operatorlogin	Sets work space and parameters for the operator (M)

vnmrjcmd() Commands to invoke the GUI popup (C)

Syntax:

```
vnmrjcmd('command1','command2',..., parametername)
vnmrjcmd('command1','command2',...<, callback>)
```

Description: The `vnmrjcmd()` commands are needed in order to invoke the GUI popup in which the user enters the parameters.

Note that `vnmrbg` and VnmrJ cannot be easily synchronized. When a macro invokes VnmrJ via `vnmrjcmd`, the VnmrJ thread runs independently and the macro continues on and takes action without otherwise having knowledge of VnmrJ. In order to have events associated with required parameters occur in the proper order, a callback strategy was devised. In simple terms, the vnmrj commands can have a `callback` string such that when the required parameters are established in VnmrJ, `vnmrbg` can be re- invoked - the foremost example of this is re-entering the 'go' macro after the parameters are established in VnmrJ.

Examples: Sends parameters one at a time to VnmrJ to be eventually displayed in an entry popup:

```
vnmrjcmd('reqpar','warngui','set', 'real',
parametername)
vnmrjcmd('reqpar','warngui','set', 'string',
parametername)
```

Display a GUI panel listing required parameters sent from `vnmrbg` in the previous 'set' option above:

```
vnmrjcmd('reqpar','warngui','show')
vnmrjcmd('reqpar','warngui','show', callback)
```

The callback is a command string to be sent back to `vnmrbg`, if needed. See the `reqpartest` macro source code for examples of how to use callback.

See also: *VnmrJ User Programing*

Related
- `go` Submit experiment to acquisition (M)
- `reqpartest` Tests whether required parameters are set (M)

`vnmrexit` Exit from the VNMR system (C)

Description: Exits from the VNMR system in a graceful manner by writing parameters and data to the disk, removing lock files, and restoring the terminal (if on a GraphOn). To provide flexibility when exiting VNMR, the macro `exit` calls `vnmrexit` to exit from VNMR.

CAUTION: **When you exit from the VNMR user interface on your X display system, whether you are using an X terminal or a Sun computer, and whether you are using OpenWindows, CDE, or Motif, you must first exit from any copy of VNMR running on your system. Failure to do this can cause current parameter values and even current data to be lost.**

`vnmrj` Start VnmrJ (U)

Applicability: VnmrJ

Syntax: `vnmrj`

Description: Starts the VnmrJ application

See also: *NMR Spectroscopy User Guide; VnmrJ Walkup*

Related:
- `vnmr` Starts VnmrJ (U)

`vnmrplot` Plot files (U)

Syntax: (From UNIX) `vnmrplot <file>`

Description: A UNIX command that plots files from inside VNMR commands. To plot a file, you should use the `page` command, which uses `vnmrplot` internally.

Arguments: `file` is the name of the file to be plotted.

See also: *NMR Spectroscopy User Guide*

Related:
- `vnmrprint` Print text files (U)

`vnmrprint` Print text files (U)

Syntax: (From UNIX) `vnmrprint printfile <printcap>`
`<printer_type <clear|file>>`

Description: A UNIX command installed as part of the VNMR system to print text files. The `printon` and `printoff` commands use `vnmrprint` to print files. `vnmrprint` can also be used to delete a print file or save a print file to a different name.

Arguments: `printfile` is the name of the text file to be printed.

`printcap` is a UNIX printcap entry (e.g. `LaserJet_300`) for the printer to print the text file. The default is the printer selected by the `-p` option of the UNIX `lp` command.

`printer_type` is the type of printer from the list of VNMR printers (e.g., `LaserJet_300`). `printer_type` is required as an argument when it is desired to clear the printer file or save the printer file to another name.

`clear` is a keyword to delete the current print file. Deleting this file also requires that the `printfile`, `printcap`, and `printer_type` arguments be entered so that `clear` is the fourth argument.

`file` is the name of the file to use in saving the `printfile`. If a file with the name specified already exists, it is overwritten. Saving the file also requires that the `printfile`, `printcap`, and `printer_type` arguments be entered so that `file` is the fourth argument.

Examples:
```
vnmrprint /vnmr/psglib/tocsy.c LaserJet_300
vnmrprint myfile LaserJet_300 LaserJet_300 clear
vnmrprint myfile ps PS_AR yourfile
```

See also: *NMR Spectroscopy User Guide*

Related:

`printoff`	Stop sending text to printer and start print operation (C)
`printon`	Direct text output to printer (C)
`vnmrplot`	Plot files (U)

vo — Vertical offset (P)

Description: Sets the vertical offset, for 1D data sets, of the each spectrum in a *stacked display* with respect to the previous spectrum. The parameter `ho` sets the horizontal offset. For a "left-to-right" presentation, `ho` is typically negative; for a "bottom-to-top" presentation, `vo` is positive.

For 2D data sets, the parameter `wc2` sets the distance between the first and last trace and the *vo* parameter is inactive.

Values: Number, in mm.

See also: *NMR Spectroscopy User Guide*

Related:

`ho`	Horizontal offset (P)
`wc2`	Width of chart in second direction (P)

vp — Vertical position of spectrum (P)

Description: Contains vertical position of spectrum with respect to the bottom of the display or plotter.

Values: –200 to +200, in mm.

See also: *NMR Spectroscopy User Guide*

Related:

`vpf`	Current vertical position of FID (P)
`vpfi`	Current vertical position of imaginary FID (P)

vpaction — Set initial state for multiple viewports (M)

Applicability: *VnmrJ Walkup*

Description: Sets the initial state for multiple viewports. Used by the viewport editor dialog under **Edit -> Viewports**.

See also: *User Programming*

Related:

`jcurwin`	Work space numbers of all viewports (P)
`jviewportlabel`	Work space labels for all viewport buttons (P)
`jviewports`	Viewport layout (P)

vpf — Current vertical position of FID (P)

Description: Contains the current vertical position of an FID. To create this parameter and the other FID display parameters `axisf`, `crf`, `deltaf`, `dotflag`, and `vpfi` (if the parameter set is older and lacks these parameters), enter `addpar('fid')`.

Values: Number, in mm. If `vpf=0`, the FID is positioned in the middle of the screen.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
axisf	Axis label for FID displays and plots (P)
crf	Current time-domain cursor position (P)
deltaf	Difference of two time-domain cursors (P)
dotflag	Display FID as connected dots (P)
vp	Vertical position of spectrum (P)
vpfi	Current vertical position of imaginary FID (P)

vpfi — Current vertical position of imaginary FID (P)

Description: Contains the current vertical position of the imaginary part of an FID. To create this parameter and the other FID display parameters axisf, crf, deltaf, dotflag, and vpf (if the parameter set is older and lacks these parameters), enter addpar('fid').

Values: Number, in mm. In vpfi=0, the imaginary part is positioned in the middle of the screen.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
axisf	Axis label for FID displays and plots (P)
crf	Current time-domain cursor position (P)
deltaf	Difference of two time-domain cursors (P
dotflag	Display FID as connected dots (P)
vp	Vertical position of spectrum (P)
vpf	Current vertical position of FID (P)

vpset3def — Set the viewport state to three default viewports (M)

Description: Sets the number of viewports to three, and resets the viewport button labels.

See also: *User Programming*

Related:

jcurwin	Work space numbers of all viewports (P)
jviewportlabel	Work space labels for all viewport buttons (P)
jviewports	Viewport layout (P)

vpsetup — Set new viewports (M)

Description: Sets the viewports from the selections made in the viewport editor dialog. For each viewport, it checks the work space number to join, then joins the appropriate work space.

See also: *User Programming*

Related:

jcurwin	Work space numbers of all viewports (P)
jviewportlabel	Work space labels for all viewport buttons (P)
jviewports	Viewport layout (P)

vs — Vertical scale (P)

Description: In normalized (nm) mode, vs is the height of the largest peak in the spectrum. In absolute intensity (ai) mode, vs is a multiplier that is adjusted to produce a desired vertical scale, using the appearance on the display screen as a guide (full scale on the screen gives full scale on the plotter). vs can be entered in the usual way or interactively controlled by clicking the middle mouse button.

Values: 1e–6 to 1e9, in mm (in nm mode) or as a multiplier (in ai mode).

See also: *NMR Spectroscopy User Guide*

Related:

ai	Select absolute intensity mode (C)
isadj	Adjust integral scale (M)
nm	Select normalized intensity mode (C)
thadj	Adjust threshold for peak printout (M)
vsadj	Automatic vertical scale adjustment (M)
vsadj2	Automatic vertical scale adjustment by powers of two (M)
vsadjc	Automatic vertical scale adjustment for ^{13}C spectra (M)
vsadjh	Automatic vertical scale adjustment for ^{1}H spectra (M)

vs2d — Vertical scale for 2D displays (P)

Description: Sets a multiplier for 2D spectra and images that is adjusted to produce a desired vertical scale for display or plotting. vs2d takes the place of vs for 2D data display and can be adjusted by explicitly setting it to a value or by clicking the middle mouse button when pointing to a point on a 2D display. If vs2d does not exist, it can be created by running par2d.

See also: *NMR Spectroscopy User Guide*

Related:

par2d	Create 2D acquisition, processing, and display parameters (M)
vs	Select vertical scale (C)
vsproj	Adjust vertical scale for projections and traces (M)

vsadj — Automatic vertical scale adjustment (M)

Syntax: vsadj<(height)>

Description: Automatically sets the vertical scale vs in the absolute intensity (ai) mode so that the largest peak is at the requested height.

Arguments: height is the desired height, in mm, of the largest signal in the displayed portion of the spectrum. The default is 0.9*(wc2max-vp-sc2).

Examples:

```
vsadj
vsadj(100)
```

See also: *NMR Spectroscopy User Guide*

Related:

ai	Select absolute intensity mode (C)
isadj	Adjust integral scale (M)
thadj	Adjust threshold for peak printout (M)
vs	Vertical scale (P)
vsadj2	Automatic vertical scale adjustment by powers of two (M)
vsadjc	Automatic vertical scale adjustment for ^{13}C spectra (M)
vsadjh	Automatic vertical scale adjustment for ^{1}H spectra (M)
wc2max	Maximum width of chart in second direction (P)

vsadj2 — Automatic vertical scale adjustment by powers of 2 (M)

Syntax: vsadj2<(height)>:scaling_factor

Description: Adjusts the vertical scale by powers of two as required for expansion plots (see aexppl for more information).

Arguments: height is desired height of largest (or largest relevant) signal in displayed portion of the spectrum. The default is 0.9*(wc2max-vp-sc2).

scaling_factor returns to the calling macro the ratio of the new compared to the old value of vs.

Examples:
```
vsadj2
vsadj2(50):r1
```

See also: *NMR Spectroscopy User Guide*

Related:

aexppl	Automatic expansions plot (M)
isadj	Adjust integral scale (M)
sc2	Start of chart in second direction (P)
thadj	Adjust threshold for peak printout (M)
vp	Vertical position of spectrum (P)
vs	Vertical Scale (P)
vsadj	Automatic vertical scale adjustment (M)
vsadjc	Automatic vertical scale adjustment for ^{13}C spectra (M)
vsadjh	Automatic vertical scale adjustment for H1 spectra (M)
wc2max	Maximum width of chart in second direction (P)

vsadjc — Automatic vertical scale adjustment for 13C spectra (M)

Syntax: `vsadjc<(height)>`

Description: Functionally the same as the macro vsadj, except excludes solvent and TMS signals from the carbon spectra for the adjustment of vs.

Arguments: `height` is desired height of largest (or largest relevant) signal in displayed portion of the spectrum. The default is `0.9*(wc2max-vp-sc2)`.

Examples:
```
vsadjc
vsadjc(wc2max-sc2-wc2-5)
```

See also: *NMR Spectroscopy User Guide*

Related:

isadj	Adjust integral scale (M)
thadj	Adjust threshold for peak printout (M)
vs	Vertical Scale (P)
vsadj	Automatic vertical scale adjustment (M)
vsadj2	Automatic vertical scale adjustment by powers of two (M)
vsadjh	Automatic vertical scale adjustment for H1 spectra (M)

vsadjh — Automatic vertical scale adjustment for ^{1}H spectra (M)

Syntax: `vsadjh<(height<,do_not_ignore_solvent>)>`

Description: Works as the same as the macro vsadj, except disregards solvent and TMS signals from proton spectra and, if from the remaining spectrum the highest line is more than three times as high as the second highest line, the spectrum is scaled to this second highest signal (otherwise the highest signal is taken as relevant).

Arguments: `height` is desired height of largest (or largest relevant) signal in displayed portion of the spectrum. If `height` is 0 or a negative value, it defaults to `0.9*(wc2max-vp-sc2)`, which is also the default with no arguments.

`do_not_ignore_solvent` is any second argument. If present, it signals `vsadjh` to not ignore the solvent line and regard the solvent line as normal signal (i.e, only exclude the TMS line). This argument was added for the situation where frequently there are high “real” signals at the position of the solvent line. Such signals could otherwise be regarded as solvent line and would then be ignored. This could then lead to overscaling in the result.

Examples:
```
vsadjh
vsadjh(0.7*wc2max)
```

See also: *NMR Spectroscopy User Guide*

Related:

isadj	Adjust integral scale (M)
sc2	Start of chart in second direction (P)
thadj	Adjust threshold for peak printout (M)
vs	Vertical scale (P)
vsadj	Automatic vertical scale adjustment (M)
vsadj2	Automatic vertical scale adjustment by powers of two (M)
vsadjc	Automatic vertical scale adjustment for ^{13}C spectra (M)

vsproj — Vertical scale for projections and traces (P)

Description: Sets a multiplier that is adjusted to produce a desired vertical scale for projections or traces of 2D data sets. vsproj can be explicitly adjusted by setting it to a value or by clicking the middle mouse button when pointing at the projection or trace. When interactively adjusting the scale with the mouse, the higher the pointer is in the trace display, the larger the vertical scale. If the parameter does not exist, it can be created by running the par2d macro.

See also: *NMR Spectroscopy User Guide*

Related:

par2d	Create 2D acquisition, processing, and display parameters (M)
vs	Select vertical scale (C)
vs2d	Adjust vertical scale for 2D displays (M)

vtairflow — Variable Temperature Air Flow (P)

Description: This global parameter sets the VT air flow, in l/min. The adjustment is coarse, +/- 1 l/min. If there is not enough air flow available it may not reach the requested value.

Values: 0 - 25

Related:

pin	Pneumatics router interlock (P)
vtairlimits	Variable temperature air flow limits (P)

vtairlimits — Variable Temperature Air Flow Limits (P)

Description: This global parameter determines the range of safe VT air flow, as indicated by the LEDs on the flow meter. It sets the LEDs on the air flow meter, upper and lower LEDs are orange, in between are green. As long as the ball in the air flow meter is next to a green LED the air flow is considered safe. If the air flow drops or increases such that the ball is next to an orange LED, the pneumatics box will turn the VT Controller off and notify the experiment, provided the switch is in the 'run' position. A bit value of 1 sets an unsafe orange state, a bit value of 0 sets a safe green state.
To create the parameter:

```
create('vtairlimits','integer','global')
setlimit('vtairlimits',1023,0,1,'global')
```

Examples: a value of 775 or 0x307 will set the two lower and the three upper LEDs (orange) and clear the remaining 5 in between (green). Note that the upper bits determine the lower LEDs. If the parameter does not exist the value defaults to 0x307 for liquids; 0x200 for solids.

Values: 0 - 1023

Related:

pin	Pneumatics router interlock (P)

tin	Temperature interlock (P)
vtairflow	Variable temperature air flow (P)

vtc — Variable temperature cutoff point (P)

Applicability: Systems with a variable temperature (VT) module.

Description: Sets a VT cutoff point. Above this temperature, VT air flows straight into the probe, past the heater, then past the sample. Below this temperature, air goes first through the heat exchange bucket, for cooling by the heat exchange fluid, and then into the probe and past the heater.

Values: 0 to 50, in degrees celsius. vtc is typically set 5°C higher than the supply gas used for VT regulation.

See also: *NMR Spectroscopy User Guide*

Related:

temp	Sample temperature (P)
tin	Temperature interlock (P)

vtcomplvl — Variable temperature compensation for gradient shimming (P)

Description: Specifies the level of VT compensation used by gradient shimming.

Values: 0, disable VT compensation.
1, enable VT compensation
2, enable VT compensation with extra gradient dephasing.

Related:

gmapz	Get parameters and files for gmapz pulse sequence (M)
gmapsys	Run gradient autoshimming, set parameters, map shims (M)
gzsize	Number of z-axis shims used by gradient shimming (P)
temp	Sample temperature (P)
vttype	Variable temperature controller present (P)

vttype — Variable temperature controller present (P)

Description: In the Spectrometer Configuration window, this parameter specifies whether a variable temperature (VT) controller is present or not on the system. The value is set using the VT Controller label in the Spectrometer Configuration window.

When entered from command line in VNMR, control of the variable temperature (VT) controller from the current experiment is either engaged (*vttype=2)* or disengaged *(vttype=0)*. The current state of the variable temperature (VT) controller is not changed when *vttype* is set in the command window.

The variable temperature (VT) controller setting in Spectrometer Configuration is not affected by entering *vttype* on the command line.

Values: 2 is setting for VT controller (Present choice in Spectrometer Configuration window).

0 is setting for no VT controller (Not Present choice in Spectrometer Configuration window).

Examples: If *temp='some temperature'* while *vttype=2* and *vttype* is then changed to *vttype=0* on the command line, the variable temperature (VT) controller will continue regulate the sample at the value set by *temp*. While *vttype=0* changes to *temp* will have no effect.

See also: *VnmrJ Installation and Administration*; *NMR Spectroscopy User Guide*

Related:

config	Display current configuration and possibly change values (M)
masvt	Type of variable temperature system (P)

V

vtwait **Variable temperature wait time (P)**

Applicability: Systems with a variable temperature (VT) module.

Description: Sets a time for establishing temperature regulation. If temperature interlock `tin` is set and regulation is not established after the time set by `vtwait`, VNMR displays the message "`VT FAILURE`" and aborts the experiment.

Values: Number, in seconds, A typical value is 180 seconds.

See also: *NMR Spectroscopy User Guide*

Related:

`pad`	Preacquisition delay (P)
`tin`	Temperature interlock (P)

vxr_unix **Convert VXR-style text files to UNIX format (M, U)**

Syntax: (From VNMR) `vxr_unix(VXR_file<,UNIX_file>)`
(From UNIX) `vxr_unix VXR_file UNIX_file`

Description: Converts a VXR-style text file (from a Gemini, VXR, or XL system) to the UNIX format.

Arguments: `VXR_file` is the name of the input file, which must be a text file.

`UNIX_file` is the name of the output file after conversion. The names of the input and output files must be different.

Examples: (From VNMR) `vxr_unix('oldtextfile','newtextfile')`
(From UNIX) `vxr_unix oldtextfile newtextfile`

See also: *NMR Spectroscopy User Guide*

Related:

`convert`	Convert data set from a VXR-style system (C,U)
`decomp`	Decompose a VXR-style directory (C)

W

w	Who is using system (C)
walkup	Walkup automation (M)
waltz	WALTZ decoupling present (P)
wbs	Specify action when bs transients accumulate (C)
wbs	When block size (P)
wc	Width of chart (P)
wc2	Width of chart in second direction (P)
wcmax	Maximum width of chart (P)
wc2max	Maximum width of chart in second direction (P)
wdone	Specify action when experiment is done (C)
wdone	Specify action when experiment is done (P)
werr	Specify action when error occurs (C)
werr	When error (P)
wet	Flag to turn on or off wet solvent suppression ((P)
Wet1d	Set up parameters for wet ^{1}H experiment (M)
wetdqcosy	Set up parameters for a WETDQCOSY pulse sequence (M)
wetgcosy	Set up parameters for a WETGCOSY pulse sequence (M)
wetghmqcps	Set up parameters for a WETGHMQCPS pulse sequence (M)
wetghsqc	Set up parameters for a WETGHSQC pulse sequence (M)
wetgmqcosy	Set up parameters for a WETGHSQC pulse sequence (M)
wetit	Set up and create pulse shapes for Wet1d experiment (M)
wetnoesy	Set up parameters for a WETNOESY pulse sequence (M)
wetpeaks	Number of peaks for wet solvent suppression (P)
wetpwxcal	Set up parameters for a WETPWXCAL pulse sequence (M)
wettntocsy	Set up parameters for a WETTNTOCSY pulse sequence (M)
wetshape	Shape for pwwet pulses (P)
wexp	Specify action when experiment completes (C)
wexp	When experiment completes (P)
wf	Width of FID (P)
wf1	Width of interferogram in 1st indirectly detected dimension (P)
wf2	Width of interferogram in 2nd indirectly detected dimension (P)
wfgtest	Waveform generator test (M)
wft	Weight and Fourier transform 1D data (C)
wft1d	Weight and Fourier transform f_2 for 2D data (C)
wft1da	Weight and Fourier transform phase-sensitive data (M)
wft1dac	Combine arrayed 2D FID matrices (M)
wft2d	Weight and Fourier transform 2D data (C)
wft2da	Weight and Fourier transform phase-sensitive data (M)
wft2dac	Combine arrayed 2D FID matrices (M)
wftt3	Process f_3 dimension during 3D acquisition (M)
which	Display which command or macro is used (M)
wnt	Specify action when nt transients accumulate (C)
wnt	When number of transients (P)

W

wp	Width of plot in directly detected dimension (P)
wp1	Width of plot in 1st indirectly detected dimension (P)
wp2	Width of plot in 2nd indirectly detected dimension (P)
write	Write formatted text to a device (C)
writefid	Write numeric text file using a FID element (C)
writeparam	Write one of more parameters to a file (C)
writespectrum	Write a spectrum to a binary file (C)
wrtp	Command string executed after rtp command (P)
wsram	Send hardware configuration to acquisition console (C)
wshim	Conditions when shimming is performed (P)
wtfile	User-defined weighting in directly detected dimension (P)
wtfile1	User-defined weighting in 1st indirectly detected dimension (P)
wtfile2	User-defined weighting in 2nd indirectly detected dimension (P)
wtgen	Compile user-written weighting functions (M,U)
wti	Interactive weighting (C)
wtia	Interactive weighting for 2D absorptive data (M)
wtune	Specify when to tune (P)
wtunedone	What to do after ProTune tuning is done (P)
wysiwyg	Set plot display or full display (P)

w — Who is using system (C)

Description: Displays information about users currently on the system. It functions like the UNIX command of the same name.

See also: *User Programming*

walkup — Walkup automation (M)

Description: Enables using sample changers for continuous “walk-up” operation. Click on Utilities -> New automation run to run this macro from the VnmrJ Walkup interface. The macro creates a new automation directory each day with the name `auto_yyyy.mm.dd`, where `yyyy` is the year, `dd` is the day of the month, and `mm` is the month (e.g., `auto_20040601`). The automation directory is saved in a directory specified by the global parameter `globalauto`. `walkup` creates the directory `globalauto` and the parameter `globalauto`, and then sets the `globalauto` parameter.

See also: *VnmrJ Walkup*

Related:

enter	Enter sample information for automation run (M,U)
globalauto	Automation directory name (P)

waltz — WALTZ decoupling present (P)

Description: Sets whether system is equipped for WALTZ decoupling. The value is changed by normal parameter entry rather than using the Spectrometer Configuration window.

Values: `'n'` sets WALTZ decoupling not present.

`'y'` sets WALTZ decoupling present.

See also: *VnmrJ Installation and Administration*

wbs — Specify action when bs transients accumulate (C)

Syntax: `wbs(string)`

Description: Specifies what action to take when `bs` transients accumulate. The *command* `wbs` sets the corresponding *parameter* `wbs`. Using the command, rather than setting the parameter value explicitly, notifies the acquisition process that the associated parameter value has changed. Thus, the desired operation can be effected even if the experiment has already started.

Arguments: `string` is a string argument containing the command or macro to be executed when this event happens. The string must be enclosed in single quotes. If single quotes are required *within* the text string, place a backslash character before each of the interior single quotes (\'). Maximum length of the string is 256 characters. To turn off `wbs` processing, enter `wbs('')`, where the argument is two single quotes with no space between.

Syntax:
```
wbs('dg wft')
wbs('mf(3)')
wbs('')
```

See also: *NMR Spectroscopy User Guide*

Related:

`bs`	Block size (P)
`makefid`	Make a FID element using numeric text input (C)
`phfid`	Zero-order phasing constant for `np` FID (P)
`wbs`	When block size (P)
`werr`	Specify action when error occurs (C)
`wexp`	Specify action when experiment completes (C)
`wnt`	Specify action when `nt` transients accumulate (C)

wbs — When block size (P)

Description: Invokes an action to occur automatically after each `bs` block of transients is completed. For example, `wbs='wft'` results in an automatic weighting and Fourier transformation after each `bs` transients. To specify no `wbs` processing, set `wbs` to the null string. If the acquisition has already started, the `wbs` *command* must be used to change this parameter.

Values: Command, macro, or null string (`wbs=''`, where the value is given by two single quotes with no space between them).

See also: *NMR Spectroscopy User Guide*

Related:

`bs`	Block size (P)
`wbs`	Specify action when `bs` transients accumulate (C)

wc — Width of chart (P)

Description: Specifies the width of the chart (plotting or printing area).

Values: `5` to `wcmax`, in mm.

See also: *NMR Spectroscopy User Guide*

Related:

`wc2`	Width of chart in second direction (P)
`wcmax`	Maximum width of chart (P)

wc2 — Width of chart in second direction (P)

Description: Specifies width of chart (plotting or printing area) along the second axis (or *y* axis) of a 2D contour plot or 2D “stacked display.” For plots made in the `cutoff` mode, `wc2` specifies the width of the plotted area along the *y*-axis.

Values: Width, in mm.

See also: *NMR Spectroscopy User Guide*

Related:

cutoff	Data truncation limit (P)
ho	Horizontal offset (P)
sc2	Start of chart in second direction (P)
wcmax	Maximum width of chart (P)
wc2max	Maximum width of chart in second direction (P)

wcmax — Maximum width of chart (P)

Description: Specifies the maximum width of a chart (plotting or printing area). Set when plotter or printer is installed.

Values: Width, in mm.

See also: *NMR Spectroscopy User Guide*

Related:

wc	Width of chart (P)
wc2	Width of chart in second direction (P)

wc2max — Maximum width of chart in second direction (P)

Description: Specifies the maximum width of a chart (plotting or printing area) in the second direction (*y*-axis). Set when the plotter or printer is installed.

Values: Width, in mm.

See also: *NMR Spectroscopy User Guide*

Related:

wc2	Width of chart in second direction (P)
wcmax	Maximum width of chart (P)

wdone — Specify action when experiment is done (C)

Syntax: `wdone(string)`

Description: Specifies the action to take when the experiment is done, after `wexp` has been executed. The `wdone` command sets the corresponding parameter `wdone`. Using the command, rather than setting the parameter value explicitly, notifies the acquisition process that the associated parameter value has changed and the desired operation is effected even if the experiment has already started.

Arguments: The `string` argument contains the command or macro to be executed when the experiment is done. The string must be enclosed in single quotes. If single quotes are required within the text string, place a backslash character before each of the interior single quotes (`\'`). Maximum length of the string is 256 characters.

`''` (null string) turns off `wdone` processing.

Related:

wexp	Specify action when experiment completes (C)

wdone — Specify action when experiment is done (P)

Syntax: `wdone'<command, macro, or null string >'`

Description: Invokes a single action to occur just after `wexp` is executed. As with `wexp`, it is executed automatically after the experiment is finished, which can occur at the end of a single FID or after the last fid in a multi-FID experiment. To specify no `wdone` processing, set `wdone` to the null string. If the acquisition has already started, the `wdone` command must be used to change the `wdone`

parameter. For wdone to execute after an experiment finishes and after wexp has executed, start the experiment with the au command.

If the wexp action sets the wdone parameter, the new value of the wdone parameter will be executed and the old value will be ignored.

Arguments: Any command, macro, or null string (e.g. wdone='').

Related:

acquire	Acquire data (M)
au	Submit experiment to acquisition and process data (M)
wexp	When experiment completes (P)

werr — Specify action when error occurs (C)

Syntax: werr(string)

Description: Specifies what action to take if an error occurs during acquisition. The *command* werr sets the corresponding *parameter* werr. Using the command, rather than setting the parameter value explicitly, notifies the acquisition process that the associated parameter value has changed. Thus, the desired operation can be effected even if the experiment has already started.

Arguments: string is a string argument containing the command or macro to be executed when this event happens. The string must be enclosed in single quotes. If single quotes are required *within* the text string, place a backslash character before each of the interior single quotes (\'). Maximum length of the string is 256 characters. To turn off werr processing, enter werr(''), where the argument is two single quotes with no space between them.

Examples:
```
werr('react')
werr('')
```

See also: *NMR Spectroscopy User Guide*

Related:

wbs	Specify action when bs transients accumulate (C)
werr	When error (P)
wexp	Specify action when experiment completes (C)
wnt	Specify action when nt transients accumulate (C)

werr — When error (P)

Description: Specifies a macro (e.g., werr='react') that will take appropriate action when an error occurs during acquisition. To specify no werr processing, set werr to the null string. If the acquisition has already been started, the werr *command* must be used to change the werr *parameter*. Arrayed parameter acqstatus provides the error code to werr in acqstatus[1] and acqstatus[2]. For a list of error codes, refer to the description of acqstatus or view the file acq_errors in directory /vnmr/manual.

Values: Macro or null string (werr='', where the value is given by two single quotes with no space between them).

See also: *NMR Spectroscopy User Guide*

Related:

acqstatus	Acquisition status (P)
react	Recover from error conditions during werr processing (M)
werr	Specify action when error occurs (C)

W

wet — **Flag to turn on or off wet solvent suppression ((P)**

Description: Specifies if wet solvent suppression is turned on or off. It is now a standard option in many liquids pulse sequences, including Wet1d and sequences of `apptype` `hetero2d` and `homo2d`.

Related:

`apptype`	Application type (P)
`hetero2d`	Execute protocol actions of apptype hetero2d (M)
`homo2d`	Execute protocol actions of apptype homo2d (M)
`std1d`	Execute protocol actions of apptype std1d (M)
`Wet1d`	Set up parameters for a WET1D pulse sequence (M)

Wet1d — **Set up parameters for wet ^{1}H experiment (M)**

Description: Set up parameters for wet ^{1}H experiment.

wetdqcosy — **Set up parameters for a WETDQCOSY pulse sequence (M)**

Applicability: Systems with LC-NMR accessory.

Description: Sets up for a WETDQCOSY LC-NMR experiment.

See also: *NMR Spectroscopy User Guide*

wetgcosy — **Set up parameters for a WETGCOSY pulse sequence (M)**

Applicability: Systems with LC-NMR accessory.

Description: Sets up for a WETGCOSY LC-NMR experiment.

See also: *NMR Spectroscopy User Guide*

wetghmqcps — **Set up parameters for a WETGHMQCPS pulse sequence (M)**

Applicability: Systems with LC-NMR accessory.

Description: Sets up for a WETHMQCPS LC-NMR experiment.

See also: *NMR Spectroscopy User Guide*

wetghsqc — **Set up parameters for a WETGHSQC pulse sequence (M)**

Applicability: Systems with LC-NMR accessory.

Syntax: `wetghsqc('nucleus')`

Description: Sets up for a WETGHSQC LC-NMR experiment.

See also: *NMR Spectroscopy User Guide*

wetgmqcosy — **Set up parameters for a WETGHSQC pulse sequence (M)**

Applicability: Systems with LC-NMR accessory.

Description: Sets up for a WETGMQCOSY LC-NMR experiment.

See also: *NMR Spectroscopy User Guide*

wetit — **Set up and create pulse shapes for Wet1d experiment (M)**

Applicability: *VnmrJ Walkup*

Description: A macro to set up and create pulse shapes for a `Wet1d` experiment. It is based on suppressing the largest N peaks found in a spectrum.

Related: wetpeaks (P)

wetnoesy **Set up parameters for a WETNOESY pulse sequence (M)**

Applicability: Systems with LC-NMR accessory.

Description: Sets up for a WETNOESY LC-NMR experiment.

See also: *NMR Spectroscopy User Guide*.

wetpeaks **Number of peaks for wet solvent suppression (P)**

Applicability: *Walkup*

Description: Sets the number of peaks to be suppressed by wet solvent suppression for the Wet1d protocol. The wetit macro suppresses the N tallest peaks found in the scout spectrum, where N is specified by wetpeaks. The parameter is set by the *Number of peaks to suppress menu* on the Prescan page.

Values: 1 to 7 for DirectDrive or UnityInova systems; 3 for Mercury systems are the default values.

Related:		
	Wet1d	Set up parameters for wet 1H experiment (M)
	wetit	Set up and create pulse shapes for Wet1d experiment (M)

wetpwxcal **Set up parameters for a WETPWXCAL pulse sequence (M)**

Applicability: Systems with LC-NMR accessory.

Description: Sets up for a WETPWXCAL LC-NMR pulse width calibration.

See also: *NMR Spectroscopy User Guide*

wettntocsy **Set up parameters for a WETTNTOCSY pulse sequence (M)**

Applicability: Systems with LC-NMR accessory.

Description: Sets up for a WETTNTOCSY LC-NMR experiment.

See also: *NMR Spectroscopy User Guide*

wetshape **Shape for pwwet pulses (P)**

Applicability: Systems with LC-NMR accessory.

Description: Sets the name of the shape used for pwwet pulses (e.g., wetshape='wet').

See also: *NMR Spectroscopy User Guide*

wexp **Specify action when experiment completes (C)**

Syntax: wexp(string)

Description: Specifies what action to take when the experiment completes. The wexp *command* sets the corresponding *parameter* wexp. Using the command, rather than setting the parameter value explicitly, notifies the acquisition process that the associated parameter value has changed. Thus, the desired operation can be effected even if the experiment has already started.

Arguments: string is a string argument containing the command or macro to be executed when the experiment completes. The string must be enclosed in single quotes. If single quotes are required *within* the text string, place a backslash character

before each of the interior single quotes (\'). Maximum length of the string is 256 characters. To turn off wexp processing, enter wexp(''), where argument is two single quotes with no space between them.

Examples:
```
wexp('wft(\'all\') calcT1')
wexp('')
```

See also: *NMR Spectroscopy User Guide*

Related:

wbs	Specify action when bs transients accumulate (C)
werr	Specify action when error occurs (C)
wexp	When experiment completes (P)
wnt	Specify action when nt transients accumulate (C)

wexp — When experiment completes (P)

Description: Invokes a single action to occur automatically after the experiment is finished, which can occur after a single FID or after a number of FIDs in a multi-FID experiment. To specify no wexp processing, set wexp to the null string. If the acquisition has already started, the wexp *command* must be used to change the wexp *parameter*. For wexp to execute after an experiment finishes, start the experiment with the au command.

wexp processing occurs after wnt processing in a single FID experiment, and both can be used. wexp also occurs after wnt during the last FID of a multi-FID experiment. Thus, wnt='wft(\'all\')' wexp='calcT1' and wexp='wft(\'all\') calcT1' transforms each FID in a T_1 experiment as it is performed, and when each of the FIDs has been collected, performs the calculation of the T_1 using a hypothetical macro command calcT1. Notice the use of the backslash to include a single quotation mark inside the string.

Values: Command, macro, or null string (wexp='', where the value is given by two single quotes with no space between them). If the command or macro uses a file name as an argument, specifying an absolute path is best. Be sure the path is valid and you have the appropriate write permission.

See also: *NMR Spectroscopy User Guide*

Related:

wexp	Specify action when experiment completes (C)
wnt	When number of transients (P)
au	Submit experiment to acquisition and process data (C)

wf — Width of FID (P)

Description: Width of the FID display. This parameter can be entered in the usual way or interactively controlled by selecting the sf wf button during a FID display.

Values: 0 to the value of at, in seconds.

See also: *NMR Spectroscopy User Guide*

Related:

at	Acquisition time (P)
dcon	Display noninteractive color intensities map (C)
dconi	Interactive 2D data display (C)
df	Display a single FID (C)
sf	Start of FID (P)
vf	Vertical scale of FID (P)
wf1	Width of interferogram in 1st indirectly detected dimension (P)
wf2	Width of interferogram in 2nd indirectly detected dimension (P)

wf1 — Width of interferogram in 1st indirectly detected dimension (P)

Description: Sets the width of the interferogram display in the first indirectly detected dimension.

Values: 0 to (2 × ni)/sw1, in seconds.

See also: *NMR Spectroscopy User Guide*

Related:

ni	Number of increments in 1st indirectly detected dimension (P)
sf1	Start of interferogram in 1st indirectly detected dimension (P)
sw1	Spectral width in 1st indirectly detected dimension (P)
wf	Width of FID (P)

wf2 — Width of interferogram in 2nd indirectly detected dimension (P)

Description: Sets the width of the interferogram display in the second indirectly detected dimension.

Values: 0 to (2 × ni2)/sw2, in seconds.

See also: *NMR Spectroscopy User Guide*

Related:

ni2	Number of increments in 2nd indirectly detected dimension (P)
sf2	Start of interferogram in 2nd indirectly detected dimension (P)
sw2	Spectral width in 2nd indirectly detected dimension (P)
wf	Width of FID (P)

wfgtest — Waveform generator test (M)

Applicability: Systems with a waveform generator.

Description: Retrieves a parameter set and pulse sequence, and compiles the sequence, in order to set up an experiment to test the waveform generators.

See also: *Waveform Generator Kit Installation*

wft — Weight and Fourier transform 1D data (C)

Syntax:
(1) `wft<(<options,><'nf'><,start><,finish><,step>)>`
(2) `wft('inverse',exp_number,expansion_factor)`

Description: Performs a Fourier transform on one or more 1D FIDs with weighting applied to the FID. The command executes a left-shift, zero-order phase rotation, and a frequency shift according to the parameters lsfid, phfid, and lsfrq, respectively, on the time-domain data prior to the weighting and Fourier transformation. The type of Fourier transformation to be performed is determined by proc. wft uses the same arguments as the command ft, and except for weighting, it functions the same as the ft command.

See also: *NMR Spectroscopy User Guide*

Related:

ft	Fourier transform 1D data (C)
lsfid	Number of points to left-shift np FID (P)
lsfrq	Frequency shift of the fn spectrum in Hz (P)
phfid	Zero-order phasing constant for np FID (P)
proc	Type of processing on np FID (P)

wft1d — Weight and Fourier transform f_2 for 2D data (C)

Syntax:
(1) `wft1d(element_number)`
(2) `wft1d<(<options,><coefficients>)>`

Description: Performs the first Fourier transformation along the dimension defined by sw, with weighting and matrix transposition. This allows the display of t_1 interferograms with the dcon and dconi commands.

Except for weighting, wft1d functions the same as the ft1d command. See the description of ft1d for further information.

Arguments: Same as the arguments to ft1d. See the ft1d command for details.

See also: *NMR Spectroscopy User Guide*

Related:

dcon	Display noninteractive color intensity map (C)
dconi	Interactive 2D data display (C)
ft1d	Fourier transform along f_2 dimension (C)
sw	Spectral width in directly detected dimension (P)

wft1da — Weight and Fourier transform phase-sensitive data (M)

Values: wft1da<(options)>

Description: Processes 2D FID data as well as 2D planes at particular t_1 or t_2 times from a 3D data set for a pure absorptive display.

wft1da differs from ft1da only in that weighting of the time-domain data is performed prior to the Fourier transform. See the description of ft1da for further information.

Arguments: Same as arguments to ft2da. See the ft2da command for details.

See also: *NMR Spectroscopy User Guide*

Related:

ft1da	Fourier transform phase-sensitive data (M)
ft2da	Fourier transform phase-sensitive data (M)
wft2da	Weight and Fourier transform phase-sensitive data (M)

wft1dac — Combine arrayed 2D FID matrices (M)

Syntax: wft1dac<(<mult1>,<mult2>, ,...<multn>)>

Description: Allows the ready combination of 2D FID matrices within the framework of the 2D Fourier transform program. Weighting is performed. This command requires that the data be acquired either without f_1 quadrature or with f_1 quadrature using the TPPI method. wft1dac is used with TOCSY (with multiple mixing times).

Arguments: mult1,mult2,...,multn are multiplicative coefficients. The *n*th argument is a real number and specifies the multiplicative coefficient for the *n*th 2D FID matrix.

See also: *NMR Spectroscopy User Guide*

Related:

ft1dac	Combine arrayed 2D FID matrices (M)
Tocsy	Set up parameters for TOCSY pulse sequence (M)
wft2dac	Combine arrayed 2D FID matrices (M)

wft2d — Weight and Fourier transform 2D data (C)

Syntax: wft2d<(<options,>coefficients)>

Description: Performs a complete 2D transformation with weighting after 2D data has been acquired. If the first Fourier transformation has already been done using ft1d, wft1d, ft1da, or wft1da, then the wft2d command performs only the second transform.

For arrayed 2D experiments, a single array element can be transformed and weighted using the array element number as an argument. Interferograms can

be constructed explicitly using the following coefficient table:
`wft2d(rr1,ir1,rr2,ir2,...ri1,ii1,ri2,ii2,...)`.
`wft2d('ptype',...)` transforms P-type spectra, and
`wft2d('ntype',...)` transforms N-type spectra. The default is N-type.

`wft2d` also *completes* a 2D transform that has been started with `wft1d` (or related commands such as `wft1da`). The first transform will not be done again if it has already been performed. For phase-sensitive 2D experiments, the coefficients must be applied as part of the first transform (e.g., with `wft1da`) since the interferograms are formed at that stage. These coefficients need not be repeated when invoking the subsequent transform: a simple `wft2d` or `ft2d` can suffice.

See the `ft2d` command description for further information.

Arguments: Same as the arguments to `ft2d`. See the `ft2d` command for details.

Examples:
```
wft2d(1,0,0,0)
wft2d(2)
wft2d(1,0,1,0,0,1,0,1)
wft2d(.67,0,.33,0,0,.67,0,.33)
```

See also: *NMR Spectroscopy User Guide*

Related:

`dconi`	Interactive 2D data display (C)
`ft1d`	Fourier transform along f_2 dimension (C)
`ft1da`	Fourier transform “halfway” for pure absorption 2D data (M)
`ft2d`	Fourier transform 2D data (C)
`wft1d`	Weight and Fourier transform f_2 for 2D data (C)
`wft1da`	Weight and FT “halfway” for pure absorption 2D data (M)
`wft2da`	Weight and transform for pure absorption 2D data (M)

`wft2da` Weight and Fourier transform phase-sensitive data (M)

Syntax: `wft2da<(options)>`

Description: Processes 2D FID data, as well as 2D planes at particular t_1 or t_2 times, from a 3D data set for a pure absorptive display.

`wft2da` differs from `ft2da` only in that weighting of the time-domain data is performed prior to the Fourier transform. See the description of `ft2da` for further information.

Arguments: Same as used with `ft2da`. See the `ft2da` command for details.

See also: *NMR Spectroscopy User Guide*

Related:

`ft1da`	Fourier transform phase-sensitive data (M)
`ft2da`	Fourier transform phase-sensitive data (M)
`wft1da`	Weight and Fourier transform phase-sensitive data (M)

`wft2dac` Combine arrayed 2D FID matrices (M)

Syntax: `wft2dac<(<mult1><,mult2>,...<,multn>)>`

Description: Allows the ready combination of 2D FID matrices within the framework of the 2D Fourier transform program. Weighting is performed. This command requires that the data be acquired either without f_1 quadrature or with f_1 quadrature using the TPPI method. `wft2dac` is used with TOCSY (with multiple mixing times).

Arguments: `mult1,mult2,...,multn` are multiplicative coefficients. The nth argument is a real number and specifies the multiplicative coefficient for the *n*th 2D FID matrix.

See also: *NMR Spectroscopy User Guide*

Related:		
	ft1dac	Combine arrayed 2D FID matrices (M)
	ft2dac	Combine arrayed 2D FID matrices (M)
	Tocsy	Set up parameters for TOCSY pulse sequence (M)
	wft1dac	Combine arrayed 2D FID matrices (M)

wftt3 — Process f_3 dimension during 3D acquisition (M)

Description: Allows f_3 processing of 3D data to be performed concurrently with data acquisition. To invoke this function, set wnt='wftt3' and use au to start the acquisition of the 3D data. When wftt3 detects that all the FIDs comprising a (t1,t2) block have been acquired, it starts up the ft3d program in background to process that block of FIDs in f_3.

The 3D processing information file, created by entering set3dproc within VnmrJ, does not need to contain valid f_1 and f_2 processing information but only valid f_3 processing information. Once the f_3 processing is complete, a new 3D information file can be created for the f_1-f_2 processing stages that contains valid f_1 and f_2 processing information.

The non-standard string parameter path3d can be used to specify the directory into which the f_3 processed 3D data is to be stored. Normally, path3d is absent in the parameter set. If this is the case or if path3d='', the f_3-processed 3D data is stored in the directory curexp/datadir. path3d can be created by entering create('path3d','string') setgroup('path3d','display').

See also: *NMR Spectroscopy User Guide*

Related:		
	au	Submit experiment to acquisition and process data (C)
	create	Create new parameter in a parameter tree (C)
	ft3d	Perform a 3D Fourier transform (M,U)
	getplane	Extract planes from a 3D spectral data set (M)
	path3d	Path to currently displayed 2D planes from a 3D data set (P)
	select	Select a spectrum or 2D plane without displaying it (C)
	set3dproc	Set 3D processing (C)
	setgroup	Set group of a parameter in a tree (C)
	wnt	When number of transients (P)

which — Display which command or macro is used (M)

Syntax: which(name)

Description: Searches VnmrJ libraries and then displays on line 3 which VnmrJ command or macro with the given name will be executed. For macros, which displays the type of macro (user, local, application, or Varian) and the path to the library.

Arguments: name is the name of a command or macro.

Examples: which('wft')

See also: *User Programming*

Related:		
	exists	Determine if a parameter, file, or macro exists (C)
	hidecommand	Execute macro instead of command with same name (M)

wnt — Specify action when nt transients accumulate (C)

Syntax: wnt(string)

Description: Specifies what action to take when nt transients accumulate. The wnt *command* sets the corresponding *parameter* wnt. Using the command, rather than setting the parameter value explicitly, notifies the acquisition process that

the associated parameter value has changed. Thus, the desired operation can be effected even if the experiment has already started.

Arguments: `string` is a string argument containing the command or macro to be executed when this event happens. The string must be enclosed in single quotes. If single quotes are required within the text string, place a backslash character before each of the interior single quotes (`\'`). Maximum length of the string is 256 characters. To turn off `wnt` processing, enter `wnt('')`, where the argument is two single quotes with no space between them.

Examples:
```
wnt('wft(\'all\')')
wnt('')
```

See also: *NMR Spectroscopy User Guide*

Related:

`nt`	Number of transients (P)
`wbs`	Specify action when `bs` transients accumulate (C)
`werr`	Specify action when error occurs (C)
`wexp`	When experiment completes (P)
`wnt`	When number of transients (P)

wnt — When number of transients (P)

Description: Invokes a single action to occur automatically after the FID is finished (`ct=nt`) or after each FID in a multi-FID experiment involving an arrayed parameter. The most common processing to occur after an FID is an automatic weighting and Fourier transformation (i.e., `wnt='wft'`); however, this is normally not needed because the command `ga` is the exact equivalent of `wnt='wft(\'acq\')' au` (i.e., `ga` sets the `wnt` action automatically). To specify no `wnt` processing, set `wnt` to the null string. If the acquisition has already been started, the `wnt` *command* must be used to change this parameter.

Values: Command, macro, or null string (`wnt=''`, where the value is given by two single quotes with no space between them).

See also: *NMR Spectroscopy User Guide*

Related:

`nt`	Number of transients (P)
`wnt`	Specify action when `nt` transients accumulate (C)

wp — Width of plot in directly detected dimension (P)

Description: Sets the width of the displayed or plotted region of the spectrum.

Values: Always stored in Hz, but can be entered in ppm by using the `p` suffix (e.g., `wp=6p` sets the width of plot to 6 ppm).

See also: *NMR Spectroscopy User Guide*

Related:

`wp1`	Width of plot in 1st indirectly detected dimension (P)
`wp2`	Width of plot in 2nd indirectly detected dimension (P)

wp1 — Width of plot in 1st indirectly detected dimension (P)

Description: Analogous to the `wp` parameter except that `wp1` applies to the first indirectly detected dimension of a multidimensional data set.

See also: *NMR Spectroscopy User Guide*

Related:

`wp`	Width of plot in directly detected dimension (P)
`wp2`	Width of plot in 2nd indirectly detected dimension (P)

wp2 — Width of plot in 2nd indirectly detected dimension (P)

Description: Analogous to the wp parameter except that wp2 applies to the second indirectly detected dimension of a multidimensional data set.

See also: *NMR Spectroscopy User Guide*

Related:

wp	Width of plot in directly detected dimension (P)
wp1	Width of plot in 1st indirectly detected dimension (P)

write — Write formatted text to a device (C)

Syntax:

(1) `write('keywords'><,color|pen><,'reverse'>,x,y<,template>) <:height>`
(2) `write('alpha'|'printer'|'line3'|'error',template)`
(3) `write('reset'|'file'|'fileline',file<,template>)`
(4) `write('net',host,port, template)‘`

Description: Writes text to a graphics screen or plotter in a given format (syntax 1), writes formatted text to another device (syntax 2), clears a file (syntax 3), or writes to a file (syntax 3). The input to the command comes from arguments in `template`, which can be parameters such as `n1` or `pw`.

Arguments: `'keywords'` identify the output device (`'graphics'|plotter'`) and the drawing mode (`'xor'|'normal'|'newovly'|'ovly'|'ovlyC'`).

- `'graphics'|'plotter'` is a keyword selecting the output device. The default is `'plotter'`. The output selected is passed to subsequent `pen`, `move`, or `draw` commands and remains active until a different mode is specified.
- `''xor','normal'` is a keyword for the drawing mode when using the `'graphics'` output device. The default is `'normal'`. In the `'xor'` mode, if a line is drawn such that one or more points of the line are in common with a previous `'xor'` line, the common points are erased. In the `normal` mode, the common points remain. The mode selected is passed to subsequent `pen`, `move`, and `draw` commands and remains active until a different mode is specified.
- `'newovly'`, `'ovly'`, and `'ovlyC'` are keywords that specify an interactive drawing capability that is slightly slower than the `'xor'` mode but more consistent in color. `'newovly'` clears any previous draws, boxes, and writes made with the `'ovly'` modes and draws the figure. `'ovly'` draws without clearing so that multi-segment figures can be created. `'ovlyC'` clears without drawing.

`color` is the color of the text on a color display: `'red'`, `'yellow'`, `'green'`, `'cyan'`, `'blue'`, `'magenta'`, and `'white'`. The default is `'yellow'`.

`pen` is the plotter pen: `'pen1'`, `'pen2'`, etc.

`'reverse'` is a keyword specifying a sideways orientation of the output.

`x` and `y` are coordinates on the screen or plotter, in mm.

`template` is a string of formatting characters along with arguments to those characters. The format is the same as used with the UNIX `printf` command (for details, see any basic UNIX manual or enter `man printf` in UNIX). For example, `'pw = %12.5f'` is a template to format the parameter `pw` as fixed point with a field width of 12 spaces and 5 decimal places. The following format characters are implemented:

character	`%c`
integer	`%d`
hexadecimal	`%h`
exponential:	`%e`
fixed point	`%f`
exponential/fixed point	`%g`
octal	`%o`
string	`%s`
write a % character	use `write(...'%s','%')`

`height` returns the height of the characters on the screen or plotter. This is useful for positioning multiple-line displays. See the source code of the macro `dtext` in the `maclib` directory for an example of usage.

`'alpha'` is a keyword to write text to the alphanumeric screen.

`'printer'` is a keyword to print text on the printer

`'line3'` is a keyword to write text as a message on line 3.

`'error'` is a keyword to write text as an error on line 3 and sound a beep.

`'reset'` is a keyword to clear the file specified.

`'file'` is a keyword to append data to the file specified. Existing data in the file is not overwritten. By writing repeated `'file'` calls, a formatted data file can be created (see the fifth example below). Each `write` command automatically appends a carriage return (line feed) to the end of the string defined by the `template` argument. To append data without the automatic line feed, use the `'fileline'` keyword instead of `'file'`. Also, two backslashes (\\) are interpreted as a new line.

`'fileline'` is a keyword to append data to the file specified, the same as using the `'file'` keyword, but without automatically appending a carriage return (line feed) to the end of the data. Any line feeds desired must be explicitly defined (using `\n`) by the `template` argument (see the sixth example below). Furthermore, two backslashes (\\) output a single backslash into the file.

`file` is the name of the file used with the `'reset'`, `'file'`, and `'fileline'` keywords.

`'net'` is a keyword for writing to a network program. The host name and port number must be supplied. The host name may also be an IP address, such as 10.190.x.y. The hostname of the local computer is stored in the `instrument` parameter. The command `serverport` may be used to get the port number for the currently executing VnmrJ program.

Examples:

```
write('graphics',100,100):$ys
write('plotter',20,180, 'pw = %12.5f',pw)
write('line3', 'Too many arguments')
write('reset','temp1')
write('file','temp1','%10f %10.1f',n1,pw)
write('fileline','temp1','\nEnd of data\n\n')
serverport:$port
write('net',instrument,$port,'banner(`hello`)')
```

See also: *User Programming*

Related:

`dtext`	Display a text file in the graphics window (M)
`serverport`	Returns the value of the VnmrJ network listening port (C)

W

writefid — Write numeric text file using a FID element (C)

Syntax: `writefid(file<,element_number>)`

Description: Writes a text file using data from the selected FID element. The program writes two values per line—the first is the value from the X (or real) channel and the second is the value from the Y (or imaginary) channel. `writefid` writes the raw FID data (i.e., FID data processing based on the parameters `phfid`, `lsfid`, and `lsfrq` does not occur).

Arguments: `file` is the name of a text file to store the data.

`element_number` is an integer larger than 0 for the number of a FID element. The default is 1.

See also: *NMR Spectroscopy User Guide*, *User Programming*

Related:

`lsfid`	Number of complex points to left-shift `np` FID (P)
`lsfrq`	Frequency shift of `fn` spectrum in Hz (P)
`makefid`	Make a FID element using numeric text input (C)
`phfid`	Zero-order phasing constant for `np` FID (P)
`writespectrum`	Write a spectrum to a binary file (C)

writeparam — Write one of more parameters to a file (C)

Syntax: `writeparam(file,parlist[,tree]['add' | 'replace')`

Description: The `writeparam` command will write one or more parameters to a specified file. The first argument is the name of the file. The second argument is a list of the names of the parameters to be written. It is a string parameter and the names can be separated either by a space or a comma. The optional third argument is the tree from which the parameters are copied.

The variable trees are `'current', 'global'. 'processed'` and `'systemglobal'`.

An optional final argument is the keyword `'add'` or `'replace'`. The add keyword will cause the parameters to be appended to the specified file.

If they already exists in the file, their values will be updated. The replace keyword will replace the values in the file with the current values from the tree. The parameters must exist in both the file and the tree

A special case for the replace option occurs when the parameter list is an empty string. In this case, all the parameters in the file will be updated with the current values in the tree. If the parameter does not exist in the tree, no change will be made for that parameter.

This command may be used to store temporary values. For example, you may want to save `wexp`, `wbs`, `wnt`, etc. in order to run a setup acquisition. When it is done, you want to reset the original values. The `fread` command can to used to read the parameters back into an appropriate parameter tree.

Examples: `writeparam(curexp+'/mypar','in')`

writes the parameter in into the file `mypar` in the current experiment directory.

`writeparam(curexp+'/mypar','sw ct np','processed')`

writes the parameters `sw`, `ct`, and `np` from the processed tree into the file `mypar` in the current experiment directory.

writespectrum — write a spectrum to a binary file (C)

Description: Writes out the current spectrum as a binary file. The file has no header information and is written in the native format (little-endian on Linux; big-endian on Solaris).

writespectrum scales the data by vs, determines the mode selected, ph, av, or pwr, and writes whatever is displayed by ds. The file is written in the current experiment as specN, where N is the element number.

Examples: Write files spec1, spec2, spec3 ... spec{arraydim} in the current experiment directory:

```
wft $i=0 while ($i < arraydim) do $i = $i + 1
select($i) writespectrum endwhile
```

Write the real and imaginary components if phase mode is selected.

```
wft
ph
$i=0
$index=''
while ($i < arraydim) do
      $i = $i + 1
      format($i,0,0):$index
      select($i)
      writespectrum
      mv(curexp+'/spec'+$index, curexp+'/
       spec'+$index+'.re')
      rp = rp + 90
      writespectrum
      mv(curexp+'/spec'+$index, curexp+'/
       spec'+$index+'.im')
      rp = rp - 90
endwhile
```

Related: writefid — Write numeric text file using a FID element (C)

wrtp — Command string executed after rtp command (P)

Description: Holds the command string that is executed after an rtp command finishes. It is mostly used to set frequency-dependent parameter values, such as sw, so that one parameter set can be used on all spectrometers.

Examples: `wrtp='setsw(13p,-2p)'`

wsram — Send hardware configuration to acquisition console (C)

Syntax: `wsram<:$success>`

Description: Sends new hardware configuration information to the acquisition console when config is used (e.g., to set lockfreq). wsram (write to static RAM) is not normally entered directly by the user.

Arguments: success returns 1 if wsram is successful, or 0 otherwise.

See also: *VnmrJ Installation and Administration*.

Related:
- config — Display current configuration and possibly change it (M)
- lockfreq — Lock frequency (P)

wshim — Conditions when shimming is performed (P)

Description: Specifies when automatic shimming is to be used, according to the method specified by the parameter method.

Values: 'n' sets that no automatic shimming is performed. Even with wshim set to this value, the shimming procedure specified by the parameter method can be activated by using the shim command.

'e' or 'exp' sets that automatic shimming is done before data acquisition.

's' or 'samp' sets that automatic shimming is done only at the beginning of the first experiment, following the change of a sample using the automatic sample changer.

'g' sets that automatic shimming using gradient shimming is done only at the beginning of the first experiment, following the change of a sample using the automatic sample changer. The parameter method is ignored. This option is only available in automation and is not used with the go, ga, or au commands.

'f' or 'fid' set automatic shimming is done prior to the data collection of each new array member in a multi-FID experiment.

'f*n*', where *n* is an integer, sets shimming is done prior to data collection of every *n*th FID (e.g., wshim='f16' shims prior to acquiring FIDs 1, 17, 33, etc.). This method is only relevant to arrayed or 2D experiments.

See also: *NMR Spectroscopy User Guide*

Related:

gf	Prepare parameters for FID/spectrum display in acqi (M)
method	Autoshim method (P)

wtfile — User-defined weighting in directly detected dimension (P)

Description: Set to name of the file containing the user-written weighting function along the directly detected dimension. This dimension is referred to as the f_2 dimension in 2D data sets, the f_3 dimension in 3D data sets, etc. The shellscript wtgen is used to compile the user-written weighting module into an executable program. The source file is stored in the directory vnmruser+'/wtlib' with a .c file extension. The executable file is in the same directory and has the same name as the source file but has no file extension.

Values: file is the name of the executable weighting function or the name of the weighting function text file.

'' (two single quotes with no space in between) indicates wtfile is inactive and VnmrJ should not look for a user-written weighting function.

See also: *NMR Spectroscopy User Guide; User Programming*

Related:

wtfile1	User-defined weighting in 1st indirectly detected dimension (P)
wtfile2	User-defined weighting in 2nd indirectly detected dimension (P)
wtgen	Compile user-written weighting functions (C,U)

wtfile1 — User-defined weighting in 1st indirectly detected dimension (P)

Description: Set to the name of the file containing the user-written weighting function for the first indirectly detected dimension. This dimension is often referred to as the f_1 dimension of a multidimensional data set. Otherwise, wtfile1 is analogous to wtfile.

See also: *NMR Spectroscopy User Guide; User Programming*

Related:

wtfile	User-defined weighting in directly detected dimension (P)
wtfile2	User-defined weighting in 2nd indirectly detected dimension (P)

wtfile2 — User-defined weighting in 2nd indirectly detected dimension (P)

Description: Set to the name of the file containing the user-written weighting function along the second indirectly detected dimension. This dimension is often referred to as the f_2 dimension of a multidimensional data set. wtfile2 can be set with wti on the 2D interferogram data. Otherwise, wtfile2 is analogous to wtfile.

See also: *NMR Spectroscopy User Guide; User Programming*

Related:		
	wtfile	User-defined weighting in directly detected dimension (P)
	wtfile1	User-defined weighting in 1st indirectly detected dimension (P)
	wti	Interactive weighting (C)

wtgen — Compile user-written weighting functions (M,U)

Syntax: (From VnmrJ) `wtgen(file<.c>)`
(From UNIX) `wtgen file<.c>`

Description: Allows compilation of a user-written weighting function that subsequently can be executed from within VnmrJ. `wtgen` performs the following functions:

- Checks for the existence of the `/vnmr/bin` directory and aborts if the directory is not found.
- Checks for files `usrwt.o` and `weight.h` in the `/vnmr/bin` directory and aborts if either of these two files cannot be found there.
- Checks for the existence of the user's directory and creates this directory if it does not already exist.
- Establishes in the `wtlib` directory soft links to `usrwt.o` and `weight.h` in the `/vnmr/bin` directory.
- Compiles the user-written weighting function, which is stored in the `wtlib` directory, link loads it with `usrwt.o`, and places the executable program in the same directory; any compilation and/or link loading errors are placed in the file `errmsg` in `wtlib`.
- Removes the soft links to `usrwt.o` and `weight.h` in the `/vnmr/bin` directory.

The name of the executable program is the same as that for the source file without a file extension (e.g., `testwt.c` is the source file for the executable file `testwt`).

Examples: (From VnmrJ) `wtgen('testwt')`
(From UNIX) `wtgen testwt.c`

See also: *User Programming*

Related:		
	wtfile	User-defined weighting for t_2 (P)
	wtfile1	User-defined weighting for t_1 (P)
	wtfile2	User-defined weighting in ni2 dimension (P)

wti — Interactive weighting (C)

Syntax: `wti<(element_number)>`

Description: Allows weighting parameters to be set interactively for both t_2 FIDs and t_1 interferograms. *wti* responds appropriately to phfid and lsfid for t_2 FIDs and to phfid1 and lsfid1 for t_1 interferograms. The following parameters can be interactively weighted:

- awc, awc1, and awc2 set the additive weighting constant; added in to the weighting function after the lb and sb (or sbs) contributions but before the gf (or gfs) contributions.
- gf, gf1, and gf2 set the Gaussian apodization constant, in seconds.
- gfs, gfs1, and gfs2 set the Gaussian function shift, in seconds; shifts the origin of the Gaussian function; active only if gf (or gf1) is active.

- lb, lb1, and lb2 set the line broadening factor, in Hz; a positive value gives sensitivity enhancement; a negative value gives resolution enhancement.
- sb, sb1, and sb2 set the sinebell time period, in seconds; a negative value give a sine squared bell.
- sbs, sbs1, and sbs2 set the sinebell shift, in seconds; shifts the origin of the sine bell; active only if sb (or sb1) is active.

These parameters can be typed in or changed with the left mouse button in the proper field. The right mouse button turns off the spectrum for a faster response to changes in the weighting function.

Arguments: element_number specifies which FID element or interferogram trace is to be used in adjusting the weighting parameters. The default is the currently active element or trace.

Examples:
```
wti
wti(3)
```

See also: *NMR Spectroscopy User Guide*

Related:

lsfid	Number of complex points to left-shift np FID (P)
lsfid1	Number of complex points to left-shift ni interferogram (P)
phfid	Zero-order phasing constant for np FID (P)
phfid1	Zero-order phasing constant for ni interferogram (P)
wtia	Interactive weighting for 2D absorptive data (C)

wtia — Interactive weighting for 2D absorptive data (M)

Syntax: `wtia<(element_number)>`

Description: Allows weighting parameters to be set interactively for both t_2 FIDs and t_1 interferograms in 2D absorptive data. Refer to the description of the wti command for further information.

Arguments: element_number specifies which FID element or interferogram trace is to be used in adjusting the weighting parameters. The default is the currently active trace.

See also: *NMR Spectroscopy User Guide*

Related:

lsfid	Number of complex points to left-shift np FID (P)
lsfid1	Number of complex points to left-shift ni interferogram (P)
phfid	Zero-order phasing constant for np FID (P)
wti	Interactive weighting (C)

wtune — Specify when to tune (P)

Applicability: Liquids, VnmrJ Walkup, Automation

Description: Specify when automatic probe tuning will happen.

Syntax: `wtune ='value1<value2>...'`

Values:
's' – when a new sample is inserted
'e' – before each experiment
'o' – change of operator
'v' – change of solvent
't' – change of temperature
'1' – change of high band frequency (tn or dn)
'2' – change of low band frequency (dn or tn)

'n' – do not tune, if 'n' is included in argument list, no tuning will occur.

Examples: wtune ='st12'

The system will tune when a new sample is inserted (s) or the temperature changes for the current or new sample (t) or there is a change in the high band frequency (tn or dn) (1) or there is a change of low band frequency (dn or tn) (2).

See also: *NMR Spectroscopy User Guide* and *VnmrJ Walkup*

Related:

tunemethod	Method to use for tuning (P)
protune	Macro to start ProTune (M)
wtunedone	What to do after ProTune tuning is done (P)

wtunedone — What to do after ProTune tuning is done (P)

Description: Specific what to do after ProTune tuning is done. This is a local string parameter that does not exist by default and must be created to specify a command to be executed after tuning is finished.

See also: *NMR Spectroscopy User Guide* and *VnmrJ Walkup*

Related:

protune	Macro to start ProTune (M)
create	Create new parameter in a parameter tree (C)
wtune	Specify when to tune (P)

wysiwyg — Set plot display or full display (P)

Description: Sets whether the window display is the same as the plot ("what you see is what you get," or WYSIWYG) or is expanded to fill the window. This allows the user to scale the image to the full window, making it easier to view. This parameter is in the user's global parameter file.

Values: 'y' makes the window picture size depend on the current plotter setting. Scaling the window does not change the ratio of the picture. This value is the default display condition.

'n' makes the window display expand, giving a full display.

See also: *NMR Spectroscopy User Guide*

X

x0	X-zero position of HP pen plotter or Postscript device (P)
x1	X1 shim gradient (P)
x2y2	X2Y2 shim gradient (P)
x3	X3 shim gradient (P)
x4	X4 shim gradient (P)
xdiag	Threshold for excluding diagonal peaks when peak picking (P)
xgate	Load time counter (M)
xm1	Utility macro for study queue experiment manager (M)
xmaction	Perform study queue action (M)
xmactionw	Perform study queue action for walkup (M)
xmaddreq	Add a required protocol before the main protocol (M)
xmcheckreq	Check required protocol name (M)
xmconvert	Convert a temporarily stored study into a submitted study (M)
xmcopy	Copy protocols in a study queue (M)
xmdelete	Delete nodes in a study queue (M)
xmenablepanel	Enable or disable a parameter panel (M)
xmendq	End a chained study queue (M)
xmgetatts	Get study queue attributes (M)
xmHprescan	Set up and process Proton prescans (M)
xminit	Initialize an imaging study queue (M)
xmlockup	Move a study queue node up and lock it (M)
xmmakenode	Make a new study queue node (M)
xmnext	Find next prescan or next experiment in study queue (M)
xmprescan	Run prescans in study queue (M)
xmreact	Recover from error conditions during automation study (M)
xmreadnode	Read attributes from a study queue node (M)
xmrtpar	Retrieve parameters from a study queue node (M)
xmsample	Write enterQ entry for a sample for study queue – automation (M)
xmsara	Write sample enterQ entry for study queue– imaging (M)
xmsatfrq	Processing for Presat experiment (M)
xmselect	Action when study queue node is selected (M)
xmsetattr	Set an attribute for a study queue node (M)
xmsetatts	Set an attribute for a study queue node (M)
xmshowdata	Show data from a study queue node (M)
xmstartnightq	Start the night queue (M)
xmsubmit	Submit sample(s) to the study queue (M)
xmtime	Update the study queue time (M)
xmtune	Check tune parameter during automation (M)
xmwerr	Recover from acquisition error in study queue (M)
xmwexp	Processing macro for end of acquisition in study queue (M)
xmwritenode	Write study queue node attributes (M)
xmwritesq	Write study queue node order (M)
xpol	Cross-polarization (P)

xpolar1	Set up parameters for XPOLAR1 pulse sequence (M)
xy	XY shim gradient (P)
xz	XZ shim gradient (P)
xz2	XZ2 shim gradient (P)

x0 — X-zero position of HP pen plotter or Postscript device (P)

Applicability: Systems with a Hewlett-Packard pen plotter or a Postscript output device.

Description: Adjusts the *x*-zero position on the chart. Use hpa to adjust x0 (and y0) to place the numbers in a pleasing position when filled in on the blank lines. x0 is part of vnmrsys/global and hence common to all experiments.

Values: Number, in mm.

See also: *NMR Spectroscopy User Guide*

Related:

hpa	Plot parameters on special preprinted chart paper (C)
y0	Y-zero position of HP plotter or Postscript device (P)

x1 — X1 shim gradient (P)

Description: Holds current setting of the X1 radial shim gradient.

Values: If shimset is 1, 2, 8, 10: –2048 to +2047, steps of 1, 0 is no current.
If shimset is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

shimset	Type of shim set (P)

x2y2 — X2Y2 shim gradient (P)

Description: Holds current setting of the X2Y2 radial shim gradient.

Values: If shimset is 1, 2, 8, 10: –2048 to +2047, steps of 1, 0 is no current.
If shimset is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

shimset	Type of shim set (P)

x3 — X3 shim gradient (P)

Description: Holds current setting of the X3 radial shim gradient.

Values: If shimset is 1, 2, 10: –2048 to +2047, steps of 1, 0 is no current.
If shimset is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

shimset	Type of shim set (P)

x4 — X4 shim gradient (P)

Description: Holds current setting of the X4 radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

shimset	Type of shim set (P)

xdiag **Threshold for excluding diagonal peaks when peak picking (P)**

Description: Used by the ll2d program to exclude diagonal peaks when peak picking.

To create the 2D peak picking parameters xdiag and th2d in the current experiment, enter addpar('ll2d').

Values: Peaks within xdiag Hz of the diagonal will not be picked by ll2d. Setting xdiag to 0.0 will cause ll2d to pick all peaks, including diagonal peaks.

See also: *NMR Spectroscopy User Guide*

Related:

addpar	Add selected parameters to the current experiment (M)
ll2d	Automatic and interactive 2D peak picking (C)
th2d	Threshold for integrating peaks in 2D spectra (P)

xgate **Load time counter (M)**

Applicability: Systems with a solids module.

Syntax: xgate(counts)

Description: Loads the (12-bit) time counter on the pulse programmer with the specified number of counts and switches the counter to the external time base (the external trigger). On each trigger, the counter counts one unit down, and the next pulse sequence event starts when the count reaches zero. Often that time count will be just 1 (1.0, as the argument must be a floating point number). If the final pulse is to be performed after a longer delay, two options are available:

- Perform a normal delay, followed by the xgate(1.0) call.
- Calculate how many rotor cycles that delay would be (calculation is typically done based on a parameter srate) and then perform xgate with that calculated number of rotor triggers. Be aware that the only number of rotor cycles that can be counted this way is 4096, because the pulse programmer uses a 12-bit counter). At typical rotor speeds of 5 to 10 kHz, the “counted” delay is limited to 0.8 to 0.4 seconds.

Arguments: counts is the number of counts to load into the time counter. The value must be a floating point number.

Examples: xgate(5.0)

See also: *User Guide: Solid-State NMR; VNMR Pulse Sequences*

Related:

srate	Spinning rate for magic angle spinning (P)

xm1 **Utility macro for study queue experiment manager (M)**

Description: A utility macro for setting study queue attributes and other study queue operations. Usually called from other macros, and not from the command line.

xmaction **Perform study queue action (M)**

Applicability: *VnmrJ Walkup*, Imaging

Description: Perform an action on an experiment node in the study queue. Usually called from study queue actions, and not from the command line.

xmactionw **Perform study queue action for walkup (M)**

Applicability: *VnmrJ Walkup*

Description: Perform an action on an experiment node in the study queue. Usually called from other macros, and not from the command line.

X

xmaddreq **Add a required protocol before the main protocol (M)**

Applicability: *VnmrJ Walkup*, Imaging

Description: Add a required protocol before the main protocol, when adding a protocol to the study queue. Usually called from other macros, and not from the command line.

See also: *VnmrJ Walkup*, *VnmrJ Imaging User's Guide*

Related:
- `xmmakenode` Make a new study queue node (M)

xmcheckreq **Check required protocol name (M)**

Applicability: *VnmrJ Walkup*, Imaging

Description: Check if a required protocol exists in the study queue, and return the full path filename to data, if data has been acquired. Usually called from plotting macros, and not from the command line.

See also: *VnmrJ Walkup*, *VnmrJ Imaging User's Guide*

Related:
- `cqplot` Macro to perform generic 2D plot (M)
- `plot2D` Plot 2D spectra (M)

xmconvert **Convert a temporarily stored study into a submitted study (M)**

Applicability: *VnmrJ Walkup*, Imaging

Description: Convert a temporarily stored study into a submitted study. Usually only called from other macros.

See also: *VnmrJ Walkup*, *VnmrJ Imaging User's Guide*

Related:
- `xmsubmit` Submit sample(s) to the study queue (M)

xmcopy **Copy protocols in a study queue (M)**

Applicability: *VnmrJ Walkup*, Imaging

Description: Copy protocols within a study queue. Usually only called from other macros.

See also: *VnmrJ Walkup*, *VnmrJ Imaging User's Guide*

Related:
- `xmaction` Perform study queue action (M)
- `xmactionw` Perform study queue action for walkup (M)

xmdelete **Delete nodes in a study queue (M)**

Applicability: *VnmrJ Walkup*, Imaging

Description: Delete nodes within a study queue. Usually only called from other macros.

See also: *VnmrJ Walkup*, *VnmrJ Imaging User's Guide*

Related:
- `sqfilemenu` Study queue file menu commands (M)
- `xmaction` Perform study queue action (M)
- `xmactionw` Perform study queue action for walkup (M)

xmenablepanel **Enable or disable a parameter panel (M)**

Description: Enable or disable a parameter panel. Usually used to disable the Acquire panel for Imaging applications. Usually called only from a panel.

xmendq **End a chained study queue (M)**

Applicability: *VnmrJ Walkup*

Description: End a chained study queue in the Walkup interface. Usually called by other macros.

See also: *VnmrJ Walkup*

Related: `xmnext` Find next prescan or next experiment in study queue (M)

`xmgetatts` Get study queue attributes (M)

Applicability: *VnmrJ Walkup*, Imaging

Description: Get study queue attributes.

See also: *VnmrJ Walkup, VnmrJ Imaging User's Guide*

Related: `xmaction` Perform study queue action (M)

`xmHprescan` Set up and process Proton prescans (M)

Applicability: *VnmrJ Walkup*

Description: A macro to set up and process prescans for Proton-type experiments (Proton, Presat, or Wet1d protocols). Usually called from other macros, and not from the command line.

See also: *VnmrJ Walkup, VnmrJ Imaging User's Guide*

Related: `Hprescan` Proton prescan (P))
`std1d` Apptype macro for Standard 1D experiments (M)

`xminit` Initialize an imaging study queue (M)

Applicability: Imaging

Description: Initialize an imaging study queue. Usually called from other macros, and not from the command line.

See also: *VnmrJ Imaging User's Guide*

Related: `sqfilemenu` Study queue file menu commands (M)

`xmlockup` Move a study queue node up and lock it (M)

Applicability: *VnmrJ Walkup*, Imaging

Description: A macro to move a study queue node up above other completed nodes in the study queue, and lock it so it cannot be moved. This is usually done just prior to acquisition. Usually called from other macros, and not from the command line.

See also: *VnmrJ Walkup, VnmrJ Imaging User's Guide*

Related: `acquire` Acquire data (M)

`xmmakenode` Make a new study queue node (M)

Applicability: *VnmrJ Walkup*, Imaging

Description: Create a new node in the study queue. Usually only called by other macros.

See also: *VnmrJ Walkup, VnmrJ Imaging User's Guide*

Related: `locaction` Locator action (M)
`xmaddreq` Add a required protocol before the main protocol (M)

`xmnext` Find next prescan or next experiment in study queue (M)

Applicability: *VnmrJ Walkup*

Description: Find the next prescan or next experiment in a study queue. It is used for chaining prescans and experiments. Usually only called by other macros.

See also: *VnmrJ Walkup*

Related:

acquire	Acquire data (M)
startq	Start a chained study queue (M)
xmprescan	Run prescans in study queue (M)
xmwexp	Processing macro for end of acquisition in study queue (M)

xmprescan — Run prescans in study queue (M)

Applicability: *VnmrJ Walkup*

Description: Run prescans in a study queue. Usually only called by other macros.

See also: *VnmrJ Walkup*

Related:

cqfindz0	Run an experiment to find the value of z0 (M)
gmapshim	Start gradient autoshimming (M)
prescan	Study queue prescan (P)
xmnext	Find next prescan or next experiment in study queue (M)

xmreact — Recover from error conditions during automation study (M)

Applicability: *VnmrJ Walkup*

Description: A macro to recover from error conditions during a study queue automated acquisition. Usually only called by other macros.

See also: *VnmrJ Walkup*

Related:

acquire	Acquire data (M)
react	Recover from error conditions during werr processing (M)

xmreadnode — Read attributes from a study queue node (M)

Applicability: *VnmrJ Walkup*, Imaging

Description: Read attributes from a study queue node. Usually only called by other macros

See also: *VnmrJ Walkup*, *VnmrJ Imaging User's Guide*.

Related:

xmaction	Perform study queue action (M)
xmactionw	Perform study queue action for walkup (M)
react	Recover from error conditions during werr processing (M)

xmrtpar — Retrieve parameters from a study queue node (M)

Applicability: Imaging

Description: Retrieve parameters from a study queue node after its parameters have been customized. Usually only called by other macros.

See also: *VnmrJ Imaging User's Guide*

Related:

xmmakenode	Make a new study queue node (M)
xmselect	Action when study queue node is selected (M)

xmsample — Write enterQ entry for a sample for study queue – liquids (M)

Applicability: *VnmrJ Walkup*, systems with automation such as sample changer or LC-NMR.

Description: Write the information required for a sample in the study queue when the sample is submitted. Usually only called by other macros.

See also: *VnmrJ Walkup*

Related:

`loc`	Location of sample in tray (P)
`xmsubmit`	Submit sample(s) to the study queue (M)

`xmsara` Write enterQ entry for a sample for study queue – imaging (M)

Applicability: Imaging

Description: Halt or resume acquisition in the study queue, especially when using multiple viewports. Usually only called from interface panels.

`xmsatfrq` Processing for Presat experiment (M)

Applicability: *VnmrJ Walkup*

Description: A macro to handle processing steps for the Presat experiment. It is optimized for use with water. Usually only called from other macros.

See also: *VnmrJ Walkup*

Related:

`xmHprescan`	Set up and process Proton prescans (M)

`xmselect` Action when study queue node is selected (M)

Applicability: *VnmrJ Walkup*

Description: A macro to specify the action taken when a study queue node is selected by double-clicking on it. The action depends on the node status, which is Ready for acquisition, Executing, Completed, etc. The macro also runs the macros associated with selecting a study queue node, and saves the parameters of the current node before retrieving parameters of the selected node.

See also: *VnmrJ Walku*

Related:

`xmaction`	Perform study queue action (M)
`xmactionw`	Perform study queue action for walkup (M)
`xmrtpar`	Retrieve parameters from a study queue node (M)

`xmsetatts` Set an attribute for a study queue node (M)

Applicability: *VnmrJ Walkup*, Imaging

Description: Set an attribute for a study queue node.

See also: *VnmrJ Walkup*, *VnmrJ Imaging User's Guide*

Related:

`xmaction`	Load colors for graphics window and plotters (M)
`xmactionw`	Location of sample in tray (P)

`xmsetattr` Set an attribute for a study queue node (M)

Applicability: *VnmrJ Walkup*, Imaging

Description: Set an attribute for a study queue node.

See also: *VnmrJ Walkup*, *VnmrJ Imaging User's Guide*

Related:

`xmaction`	Load colors for graphics window and plotters (M)
`xmactionw`	Location of sample in tray (P)

`xmshowdata` Show data from a study queue node (M)

Applicability: *VnmrJ Walkup*, Imaging

Description: A macro that retrieves data from a completed study queue node. In the Walkup liquids interface, data is also processed if *Process data on drag-and-drop* from locator is selected in the *System settings* dialog in the Utilities menu.

See also: *VnmrJ Walkup, VnmrJ Imaging User's Guide*

Related:
- `xmselect` — Action when study queue node is selected (M)

`xmstartnightq` Start the night queue (M)

Applicability: *VnmrJ Walkup*

Description: Start the night queue. It also is used to initialize the night queue settings in the Utilities menu.

Examples:
`xmstartnightq` start the night queue
`xmstartnightq('at')` initialize the night queue settings.

See also: *VnmrJ Walkup, VnmrJ Imaging User's Guide*

Related:
- `walkup` — Walkup automation (M)

`xmsubmit` Submit sample(s) to the study queue (M)

Applicability: *VnmrJ Walkup*, systems with automation such as sample changer or LC-NMR.

Description: Submit the sample or samples selected in the study queue tray. If the Submit DayQ button below the study queue area is selected, samples are submitted to the DayQ. If the Submit NightQ button is selected, samples are submitted to the NightQ.

See also: *VnmrJ Walkup*

Related:
- `xmsample` — Write enterQ entry for a sample for study queue – automation (M)

`xmtime` Update the study queue time (M)

Applicability: *VnmrJ Walkup*, systems with automation such as sample changer or LC-NMR.

Description: Update the study queue time for both DayQ and NightQ. Usually only called from panels or other macros.

See also: *VnmrJ Walkup*

Related:
- `sqfilemenu` — Study queue file menu commands (M)
- `startq` — Start a chained study queue (M)
- `studytime` — Study time (P)
- `xmsubmit` — Submit sample(s) to the study queue (M)

`xmtune` Check tune parameter during automation (M)

Applicability: Automation

Syntax: `xmtune`

Description: Check tune parameters in the study queue during automation and determine if tuning will occur. Macro is usually called from within automation and not from the command line.

See also: *NMR Spectroscopy User Guide* and *VnmrJ Walkup*

Related:
- `protune` — Macro to start ProTune (M)
- `tunemethod` — Method to use for tuning (P)
- `wtune` — Specify when to tune (P)

xmwerr **Recover from acquisition error in study queue (M)**

Applicability: *VnmrJ Walkup*, Imaging

Description: Recover from an acquisition error in a study queue when not running automation. Usually only called from other macros.

See also: *VnmrJ Walkup, VnmrJ Imaging User's Guide*

Related:

acquire	Acquire data (M)
xmreact	Recover from error conditions during automation study (M)

xmwexp **Processing macro for end of acquisition in study queue (M)**

Applicability: *VnmrJ Walkup*, Imaging

Description: A processing macro; runs at the end of acquisition in the study queue and keeps track of study queue parameters and settings. Usually only called from other macros.

See also: *VnmrJ Walkup, VnmrJ Imaging User's Guide*

Related:

acquire	Acquire data (M)
xmreact	Recover from error conditions during automation study (M)

xmwritenode **Write study queue node attributes (M)**

Applicability: *VnmrJ Walkup*, Imaging

Description: Write study queue node attributes. Usually only called from other macros.

See also: *VnmrJ Walkup, VnmrJ Imaging User's Guide*

Related:

xmaction	Load colors for graphics window and plotters (M)
xmactionw	Location of sample in tray (P)
xmsetattr	Set an attribute for a study queue node (M)

xmwritesq **Write study queue node order (M)**

Applicability: *VnmrJ Walkup*, Imaging

Description: Write the study queue node order. Usually only called from other macros.

See also: *VnmrJ Walkup, VnmrJ Imaging User's Guide*

Related:

xmaction	Load colors for graphics window and plotters (M)
xmactionw	Location of sample in tray (P)

xpol **Cross-polarization (P)**

Applicability: Systems with a solids module.

Description: Selects cross-polarization or direct polarization in solid-state NMR experiments such asXPOLAR1.

Values: `'n'` sets the experiment for direct polarization.
`'y'` sets the experiment for cross-polarization.

See also: *User Guide: Solid-State NMR*

Related:

xpolar1	Set up parameters for XPOLAR1 pulse sequence (M)

xpolar1 **Set up parameters for XPOLAR1 pulse sequence (M)**

Applicability: Systems with solids modules.

Description: Sets up the solid-state NMR cross-polarization experiment XPOLAR using the parameters. Otherwise, `xpolar1` contains the same functionality as `xpolar`.

See also: *User Guide: Solid-State NMR*

Related:

`hsrotor`	Display rotor speed for solids operation (P)
`rotorsync`	Rotor synchronization (P)

xy XY shim gradient (P)

Description: Holds current setting of the XY radial shim gradient.

Values: If `shimset` is 1, 2, 8, 10: –2048 to +2047, steps of 1, 0 is no current.
If `shimset` is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

`shimset`	Type of shim set (P)

xz XZ shim gradient (P)

Description: Holds current setting of the XZ radial shim gradient.

Values: If `shimset` is 1, 2, 8, 10: –2048 to +2047, steps of 1, 0 is no current.
If `shimset` is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

`shimset`	Type of shim set (P)

xz2 XZ2 shim gradient (P)

Description: Holds current setting of XZ2 radial shim gradient.

Values: If `shimset` is 2, 8: –2048 to +2047, steps of 1, 0 is no current.
If `shimset` is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

`shimset`	Type of shim set (P)

Y

y0	Y-zero position of HP pen plotter or Postscript device (P)
y1	Y1 shim gradient (P)
y3	Y3 shim gradient (P)
y4	Y4 shim gradient (P)
yz	YZ shim gradient (P)
yz2	YZ2 shim gradient (P)

y0 Y-zero position of HP pen plotter or Postscript device (P)

Applicability: Systems with a Hewlett-Packard pen plotter or a Postscript output device.

Description: Adjusts the *y*-zero position on the chart. Use hpa to adjust y0 (and x0) to place numbers in a pleasing position when filled in on the blank lines. y0 is part of vnmrsys/global; therefore, it is common to all experiments.

Values: Number, in mm.

See also: *NMR Spectroscopy User Guide*

Related:

hpa	Plot parameters on special preprinted chart paper (C)
x0	X-zero position of HP plotter or Postscript device (P)

y1 Y1 shim gradient (P)

Description: Holds current setting of the Y1 radial shim gradient.

Values: If shimset is 1, 2, 8, 10: –2048 to +2047, steps of 1, 0 is no current.
If shimset is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

shimset	Type of shim set (P)

y3 Y3 shim gradient (P)

Description: Holds current setting of the Y3 radial shim gradient.

Values: If shimset is 1, 2, 10: –2048 to +2047, steps of 1, 0 is no current.
If shimset is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

shimset	Type of shim set (P)

y4 Y4 shim gradient (P)

Description: Holds current setting of the Y4 radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

shimset	Type of shim set (P)

yz YZ shim gradient (P)

Description: Holds current setting of the YZ radial shim gradient.

Values: If shimset is 1, 2, 8, 10: –2048 to +2047, steps of 1, 0 is no current.
If shimset is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related: shimset Type of shim set (P)

yz2 YZ2 shim gradient (P)

Description: Holds current setting of the YZ2 radial shim gradient.

Values: If shimset is 2, 8: –2048 to +2047, steps of 1, 0 is no current.
If shimset is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related: shimset Type of shim set (P)

Z

z	Add integral reset point at cursor position (C)
z0	Z0 field position (P)
z1	Z1 shim gradient (P)
z1c	Z1C shim gradient (P)
z2	Z2 shim gradient (P)
z2c	Z2C shim gradient (P)
z2x2y2	Z2X2Y2 shim gradient (P)
z2x3	Z2X3 shim gradient (P)
z2xy	Z2XY shim gradient (P)
z2y3	Z2Y3 shim gradient (P)
z3	Z3 shim gradient (P)
z3c	Z3C shim gradient (P)
z3x	Z3X shim gradient (P)
z3x2y2	Z3X2Y2 shim gradient (P)
z3x3	Z3X3 shim gradient (P)
z3xy	Z3XY shim gradient (P)
z3y	Z3Y shim gradient (P)
z3y3	Z3Y3 shim gradient (P)
z4	Z4 shim gradient (P)
z4c	Z4C shim gradient (P)
z4x	Z4X shim gradient (P)
z4x2y2	Z4X2Y2 shim gradient (P)
z4xy	Z4XY shim gradient (P)
z4y	Z4Y shim gradient (P)
z5	Z5 shim gradient (P)
z5x	Z5X shim gradient (P)
z5y	Z5Y shim gradient (P)
z6	Z6 shim gradient (P)
z7	Z7 shim gradient (P)
z8	Z8 shim gradient (P)
zeroneg	Set all negative intensities of 2D spectra to zero (C)
zoom	Adjust display to given width (M)
zx2y2	ZX2Y2 shim gradient (P)
zx3	ZX3 shim gradient (P)
zxy	ZXY shim gradient (P)
zy3	ZY3 shim gradient (P)

z — Add integral reset point at cursor position (C)

Syntax: `z<(reset1,reset2,...)>`

Description: Resets the integral to zero at the point marked by the displayed cursor. The command `cz` removes all such integral resets and it should generally be used

before starting to enter a series of integral zeros (resets). The resets are stored as frequencies and do not change if fn is changed.

Arguments: reset1, reset2,... are reset points entered, in either Hz or ppm. The default is the cursor position). Reset points can be entered in any order.

Examples:
```
z
z(7.5*sfrq,5*sfrq,2.5*sfrq,0.1*sfrq)
```

See also: *NMR Spectroscopy User Guide*

Related:

cz	Clear integral reset points (C)
dlni	Display list of normalized integrals (C)
ds	Display a spectrum (C)
fn	Fourier number in directly detected dimension (P)
nli	Find integral values (C)

z0 — Z0 field position (P)

Description: Holds current setting of the Z0 setting. The value of z0 can be set by su. lockfreq can be used to find the lock signal or resonance. To use the lock frequency, deactivate z0 by typing the statement z0='n'. To activate z0, enter z0='y'.

Values: If shimset is 1, 2, 8, 10: –2048 to +2047, steps of 1, 0 is no current.
If shimset is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

lockfreq	Lock frequency (P)
su	Submit a setup experiment to acquisition (M)

z1 — Z1 shim gradient (P)

Description: Holds current setting of the Z1 axial shim gradient.

Values: If shimset is 1, 2, 8, 10: –2048 to +2047, steps of 1, 0 is no current.
If shimset is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

shimset	Type of shim set (P)

z1c — Z1C shim gradient (P)

Description: Holds current setting of the Z1C axial shim gradient.

Values: If shimset is 1, 2, 10: –2048 to +2047, steps of 1, 0 is no current.
If shimset is 5 or 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

shimset	Type of shim set (P)

z2 — Z2 shim gradient (P)

Description: Holds current setting of the Z2 axial shim gradient.

Values: If shimset is 1, 2, 8, 10: –2048 to +2047, steps of 1, 0 is no current.
If shimset is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:

shimset	Type of shim set (P)

z2c **Z2C shim gradient (P)**

Description: Holds current setting of the Z2C axial shim gradient.

Values: If shimset is 1, 2, 10: –2048 to +2047, steps of 1, 0 is no current.
If shimset is 5 or 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related: shimset Type of shim set (P)

z2x2y2 **Z2X2Y2 shim gradient (P)**

Description: Holds current setting of the Z2X2Y2 radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z2x3 **Z2X3 shim gradient (P)**

Description: Holds current setting of the Z2X3 radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z2xy **Z2XY shim gradient (P)**

Description: Holds current setting of the Z2XY radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z2y3 **Z2Y3 shim gradient (P)**

Description: Holds current setting of the Z2Y3 radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z3 **Z3 shim gradient (P)**

Description: Holds current setting of the Z3 axial shim gradient.

Values: If shimset is 1, 2, 8, 10: –2048 to +2047, steps of 1, 0 is no current.
If shimset is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related: shimset Type of shim set (P)

z3c **Z3C shim gradient (P)**

Description: Holds current setting of the Z3C radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z3x **Z3X shim gradient (P)**

Description: Holds current setting of the Z3X radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z3x2y2 **Z3X2Y2 shim gradient (P)**

Description: Holds current setting of the Z3X2Y2 radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z3x3 **Z3X3 shim gradient (P)**

Description: Holds current setting of the Z2X3 radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z3xy **Z3XY shim gradient (P)**

Description: Holds current setting of the Z3XY radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z3y **Z3Y shim gradient (P)**

Description: Holds current setting of the Z3Y radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z3y3 **Z3Y3 shim gradient (P)**

Description: Holds current setting of the Z3Y3 radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z4 **Z4 shim gradient (P)**

Description: Holds current setting of the Z4 shim gradient.

Values: If `shimset` is 1, 2, 8, 10: –2048 to +2047, steps of 1, 0 is no current.
If `shimset` is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related: `shimset` Type of shim set (P)

z4c **Z4C shim gradient (P)**

Description: Holds current setting of the Z4C shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z4x **Z4X shim gradient (P)**

Description: Holds current setting of the Z4X shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z4x2y2 **Z4X2Y2 shim gradient (P)**

Description: Holds current setting of the Z4X2Y2 radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z4xy **Z4XY shim gradient (P)**

Description: Holds current setting of the Z4XY radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z4y **Z4Y shim gradient (P)**

Description: Holds current setting of the Z4Y shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z5 **Z5 shim gradient (P)**

Description: Holds current setting of the Z5 axial shim gradient.

Values: If `shimset` is 2, 10: –2048 to +2047, steps of 1, 0 is no current.
If `shimset` is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related: `shimset` Type of shim set (P)

z5x **Z5X shim gradient (P)**

Description: Holds current setting of the Z5X radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z5y **Z5Y shim gradient (P)**

Description: Holds current setting of the Z5Y radial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z6 **Z6 shim gradient (P)**

Description: Holds current setting of the Z6 axial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z7 **Z7 shim gradient (P)**

Description: Holds current setting of the Z7 axial shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

z8 — Z8 shim gradient (P)

Description: Holds current setting of the Z8 shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

zeroneg — Set all negative intensities of 2D spectra to zero (C)

Description: Sets to zero all negative intensities of 2D-J spectra.

See also: *NMR Spectroscopy User Guide*

Related:
- `foldj` — Fold J-resolved 2D spectrum about f_1=0 axis (C)
- `rotate` — Rotate 2D data (C)

zoom — Adjust display to given width (M)

Syntax: `zoom(width)`

Description: Adjusts the display limits. It is useful in the display of powder patterns after `split` has been used. `zoom` both zooms in and out from the current display.

Arguments: `width` is the total display width, in Hz. Display limits are set to `±width/2`.

See also: *NMR Spectroscopy User Guide*

Related:
- `split` — Split the difference between two cursors (M)

zx2y2 — ZX2Y2 shim gradient (P)

Description: Holds current setting of the ZX2Y2 shim gradient.

Values: If `shimset` is 2, 8: –2048 to +2047, steps of 1, 0 is no current.
If `shimset` is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:
- `shimset` — Type of shim set (P)

zx3 — ZX3 shim gradient (P)

Description: Holds current setting of the ZX3 shim gradient.

Values: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

zxy — ZXY shim gradient (P)

Description: Holds current setting of the ZXY shim gradient.

Values: If `shimset` is 2, 8: –2048 to +2047, steps of 1, 0 is no current.
If `shimset` is 3 to 7, 9: –32768 to +32767, steps of 1, 0 is no current.

See also: *NMR Spectroscopy User Guide*

Related:
- `shimset` — Type of shim set (P)

zy3 — ZY3 shim gradient (P)

Description: Holds current setting of the ZY3 shim gradient.

Values: –32768 to +32767, steps of 1, 0 as no current.

See also: *NMR Spectroscopy User Guide*

Index

Symbols

& (ampersand) character, 537
.talk file, 317
/ (slash) character, 316
? (question mark) character, 462
@ (at) character, 316

Numerics

^{13}C gHSQC exp, setting up parameters for, 259
^{13}C HMQC exp, changing parameters for, 284
^{13}C HMQCTOXY exp, changing params for, 284
^{13}C HSQC exp, changing parameters for, 288
^{13}C HSQCTOXY exp, changing parameters for, 288
^{15}N gHMQC exp, setting up parameters for, 259
^{15}N gHSQC exp, setting up parameters for, 259
^{15}N HMQC exp, changing parameters for, 283, 284
^{15}N HMQCTOXY exp, changing params for, 284
^{15}N HSQC exp, changing parameters for, 288
^{15}N HSQCTOXY exp, changing parameters for, 288
16-bit integer precision, 168
18, 597
18 shim configuration, 597
1st indirectly detected dimension
  absolute value display mode, 77
  additive weighting constant, 78
  clear reference line, 114
  cursor difference, 139
  cursor position, 94, 111
  data display mode, 159
  first-order phase, 328
  Fourier number, 227
  Gaussian function, 257
  Gaussian shift constant, 258
  incremented delay, 124
  line broadening, 313
  number of increments of evolution time, 367
  phased spectra display mode, 389, 411
  power display mode, 455
  reference line frequency, 488
  reference line position, 487
  scale spectral width, 509
  set frequency referencing, 530
  set reference line, 491
  sinebell constant, 506
  sinebell shift constant, 507
  spectra width, 574
  start of plot, 547
  user-defined weighting, 636
  width of plot, 631
  zero-order phase, 495
200-kHz receiver option, 168
2D display, showing, 244
2D DOSY display
  building up, 227
2D experiments
  acquire and Fourier transform, 247
  axis labels, 79
  baseline correction, 82
  color intensity map, 129
  combine arrayed FID matrices, 236, 240
  control dconi display, 131
  convert compressed data to standard format, 225
  copy peak picking file to another file, 321
  create experiment, 94
  create new parameters, 514
  create parameters, 393
  create peak picking parameters, 397
  cross-relaxation experiment, 589
  data display, 129
  display a spectrum, 180
  display FIDs, 141
  display resolution, 62
  display spectra in whitewash mode, 181
  draw grid on 2D display, 268
  f_2 ridges, 230
  find and integrate peaks, 318
  first point multiplier, 95, 231
  first-order phase set to zero, 90
  fold J-resolved spectrum, 228
  Fourier transform 2D data, 236
  Fourier transform arrayed 2D FID data, 236
  general setup, 514
  heteronuclear 2D-J, 282
  heteronuclear chemical shift correlation, 282
  homonuclear J-resolved 2D, 284
  horizontal axis selection, 591
  INADEQUATE pulse sequence, 296
  incremented delay, 124
  intensity of spectrum at a point, 350
  interactive weighting, 637, 638
  interleaving control, 294
  J-correlation experiment, 589
  LC-NMR acquisition parameters, 314
  normalization, 370
  number of increments of evolution time, 367
  parameter creation, 49
  peak integration threshold, 586
  peak picking display control, 321
  peak picking parameters, 49
  phase selection, 412
  plot 2D peak picking results, 425
  plot grid over 2D plot, 422
  plot heteronuclear J-resolved 2D spectra, 422
  plot homonuclear J-resolved 2D spectra, 423
  plot X,H-correlation 2D spectrum, 424
  plotter units conversion, 291
  processing mode for 2D data, 432
  processing parameter group, 145
  project 2D data onto axis, 444
  pseudo-echo weighting parameters, 447
  rotate 2D data, 494
  search data set for maximum intensity, 406
  select for processing, 251
  set scaling factor, 509
  sinebell weighting, 543
  spectra plotting, 417
  spectra plotting in whitewash mode, 418
  spectra processing, 442
  spectral drift correction, 128
  stacked spectra display, 189, 191, 193
  start of chart in second direction, 508
  submit to acquisition, 264
  symmetrize INADEQUATE data, 228
  t_1 dimension, 336

type of data processing, 441
vertical offset of traces, 612
volume value, 297
weight and Fourier transform, 627
weight and Fourier transform 2D data, 628
weight and Fourier transform phase-sensitive data, 628, 629
2D experiments setup, 514
2D spectra, plotting, 427
2D spectra, setting negative intensities of, 658
^{2}H chemical shift, 546
2nd evolution dimension
set spectral width, 532
2nd indirectly detected dimension
absolute value display mode, 77
additive weighting constant, 78
clear reference line, 114
cursor difference, 139
cursor position, 94, 112
data display mode, 159
first-order phase, 329
Fourier number, 227
Gaussian function, 257
Gaussian shift constant, 258
incremented delay, 124
line broadening, 314
number of increments of evolution time, 367
phased spectra display mode, 411
power mode processing, 456
reference line frequency, 488
reference line position, 487
right phase, 495
scale spectral width, 509
set frequency referencing, 531
set reference line, 492
sinebell constant, 506
sinebell shift constant, 507
spectral width, 575
start of plot, 547
user-defined weighting, 636
width of plot, 632
32-bit integer precision, 168
3D experiments
3D plane index selected, 296
3D plane projection selected, 296
3D plane type currently displayed, 418
axis labels, 79
create experiment, 94
create parameters, 393
display 2D color map of plane from 3D data, 172
display 2D projection plane from 3D data, 173
display group of parameters, 146
display next 3D plane, 367
display previous 3D plane, 437
display series of 3D planes, 189
extract planes from 3D spectral data, 253
$f_{3\ ridges}$, 230
find and integrate peaks on 2D plane, 318
first point multiplier, 231
Fourier transform 3D FID into 3D data, 240
Fourier transform arrayed 3D data sets, 236
horizontal axis selection, 591
incremented delay, 124
N-type display, 374
number of increments of evolution time, 367
parameter creation, 49
path to 2D planes, 399
phase cycling type, 412
plot peak picking on 2D plane, 425
plot series of 3D planes, 429
process f_3 dimension, 630
processing coefficient file, 515
region selective 3D processing, 451
reset parameters after partial transform, 481
select 2D plane without displaying, 511
selective 2D processing, 239
selective transformation, 238
set 3D processing, 515
spectral dc correction, 548
t_1 and t_2 dimensions, 337
terminate 3D FT process, 307
time-domain dc correction, 218
type of data processing, 442
weight and FT phase-sensitive data, 628, 629
3rd indirectly detected dimension
incremented delay, 125
number of increments of evolution time, 368
spectral width, 575
3rd rf channel
create parameters, 224
display group of parameters, 146
display template for parameters, 393
parameter retrieval, 49
4D experiments
create acquisition parameters, 393
incremented delay, 125
number of increments of evolution time, 368
parameter creation, 49
phase cycling type, 413
4th rf channel
create parameters, 224
display group of parameters, 146
5th rf channel
create parameters, 225
90-degree pulse, 387
90-degree pulse width, 454

A

aborting acquisition
with error, 37
with no error, 276
absolute intensity display mode, 52
absolute intensity group, 52
absolute-value 2D experiment, 412
absolute-value COSY pulse sequence, 478
absolute-value data display mode, 158, 159
absolute-value display mode, 76
absolute-value MQF COSY parameter set, 264
absolute-value ROESY parameter set, 270
accounting program, 610
acq_errors file, 44
acqaddr parameter, 231
acqbin directory, 513
acqfil directory, 212, 580
Acqmeter window, 42
acquisition
abort with error, 37
abort with no error, 276
acquire FID with no processing, 264
acquisition parameter arrays, 125

action when bs transients accumulate, 621
action when error occurs, 623
action when specified transients accumulate, 630
automated proton and carbon, 276
automated proton and COSY, 278
automated proton, carbon, DEPT, 277
automated proton, carbon, HETCOR, 277
carbon, 89
carbon and APT automatically, 91
carbon and DEPT automatically, 92
create 2D parameters, 393
create 3D acquisition parameters, 393
create 4D acquisition parameters, 393
data points to acquire, 63
data points to be acquired, 373
date data is acquired, 126
delay before acquisition, 53
determine if active for experiment, 208
display status information, 542
DSP type, 188
estimate acquisition time, 587
fluorine, 214
hardware values, 521
interactive display, 40
LC-NMR 2D parameters, 314
make equal to time requested, 587
number of scans, 373
number of transients, 373
oversampling factor, 381
perform Autoshim experiment, 538
perform experiment, 65
phosphorus, 388
read hardware values, 468, 540
recover from error, 466
resume paused queue, 482
resume stopped acquisition, 465
stop acquisition, 504
stopped by temperature interlock, 588
submit Autolock experiment, 323
submit change sample, Autoshim experiment, 504
submit setup experiment, 566
submit spin setup experiment, 549
time to acquire FID, 63
trigger signals to wait, 374
acquisition bus trap, 46
acquisition computer
block size, 86
resetting, 38
Acquisition Controller board, 494
acquisition parameters group, 145
acquisition queue, resume after pause, 482
acquisition status, 44
acquisition status line, 40
Acquisition Status window, 43
activating current window activity, 306
active parameter, 377
Active study name (P), 47
activity in current window, 306
ADC overflow warning, 45
Add required protocol before the main protocol, 644
add/subtract experiment, 554
add current FID, 47
add current spectrum, 547
clear experiment, 98
delete experiment, 98
interactive mode, 48
subtract FID, 567
subtract spectrum, 555
additive weighting constant, 78, 637
allocateWithId procedure, 362
AM data conversion, 104
ampersand (&) character, 43, 44
amplifier band in use, 483
amplifier mode control, 54
amplifier type, 54
AMX data conversion, 104
AnalogPlus digital filter, 136
analyze.inp file, 55, 209, 211
analyze.list file, 56, 103, 578, 579
analyze.out file, 56, 103, 211, 407
AP Interface Type label, 101
application mode, 60
Apptype macro for dosy 2D experiments, 166
Apptype macro for Standard 1D experiments, 562
APT acquisition, 277
APT spectra
plot automatically, 419
process automatically, 60
arc cosine calculation, 39
arc sine of number, 62
arc tangent calculation, 63
arc tangent of two numbers (Y,X), 63
argument, type, return identifier for, 595
arrayed 1D spectra, 562
processing, 443
processing and plotting, 75
arrayed 2D FID matrices, 628, 629
arrayed experiment
control interleaving, 294
arrayed parameter, returning number of elements in an, 544
arrayed parameters
enter as linearly spaced, 60
order and precedence, 61
arraying LP parameters, 332
assign sysgcoil, 519
asynchronous decoupler mode, 154
attached proton test, 60
attenuator
coarse type, 91
control, 176
fine, 216
upper safety limit, 174
attributes of parameters, 151
audio filter board, 67
Audio Filter Type label, 67, 101
audio filters bandwidth, 216
auto lk gradient map generation, 69
auto.conf file, 202
auto_dir macro, 546
autocalibration, 39
getting with CH3I sample, 66
routines, 67, 68
setting up with CH#I sample, 66
with autotest sample, getting, 66
with autotest sample, setting up, 66
Autogain, see automatic gain
Autolock, see automatic lock
Automake Shimmap button, 262
automated

analysis of DEPT data, 70
carbon acquisition, 89
carbon and APT acquisition, 91
carbon and DEPT acquisition, 92
fluorine acquisition, 214
phosphorus acquisition, 388
proton acquisition, 274
proton and carbon acquisition, 276
proton and COSY acquisition, 278
proton, carbon, APT acquisition, 277
proton, carbon, DEPT acquisition, 277
proton, carbon, HETCOR acquisition, 277
automated gradient map generation macros, 68
automatic
2D normalization, 370
2D peak picking, 318
2D processing, 372
analysis of COSY data, 40
APT spectra processing, 60
calibration, 39
COSY- and NOESY-type spectra plot, 420
generic processing, 443
heteronuclear J-resolved 2D spectra plot, 422
homonuclear J-resolved 2D spectra plot, 423
integral scale adjustment, 300
macro execution, 528
plot APT-type spectra, 419
process FIDs, 443
spectra plotting, 426
vertical scale adjustment, 614, 615
X,H-correlation 2D spectrum plot, 424
automatic gain
enable Autogain, 247, 248
errors, 46
automatic lock
errors, 46
status, 53
submit Autolock experiment to acquisition, 323
automatic phasing, 58
optimized, 59
zero-order term, 58
automatic shimming, 635
create shim method string, 366
method selection, 353
submit Autoshim experiment to acquisition, 504, 538
automatic stacking for arrays, 75
automatic vertical scale adjustment, 614, 615
automation data file prefix, 74
automation directory
absolute path, 71
check for enter queue, 71
preparation for run, 69
automation directory name, 260
automation mode, 71
check if active, 69, 208
automation parameter group, 148
automation run
controlling macro, 70
enter sample information, 202
prepare automation directory, 69
resume suspended run, 75
starting, 71
suspend current run, 75
autoscaling resumes, 75
Autoshim on Z button, 262
Autoshim, see automatic shimming
autoshimming, 563
gradient, 261
autotest
application mode, 60
average value of input, 77
axis gradients, 102
axis labels, 78
FID displays and plots, 80
units, 79

B

background execution, 537
background VNMR processing, 605
backup current probe file, 39
bandpass filter offset for downsampling, 185
bandwidth for shaped pulse, 452
bandwidth of audio filters, 216
bandwidth of digital filter, 184
baseline correction, 82, 588
linear, 128
sensitivity adjustment, 338
zero-order, 338
baseline flatness, 287
beeper sound, 83
Bessel filters, 53
BINOM pulse sequence, 84
binomial water suppression, 84
blanked amplifiers, 493
block size action, 621
block size storage, 86
block size transients, 621
boxes
draw on plotter or display, 84
selected by mark command, 85
BR24 pulse sequence, 86, 117
Brickwall digital filter, 136
Bruker data files, 559
convert to VNMR, 104
read files from 9-track tape, 467
Bruker data, phasing, 58
bruker.par file, 559
Butterworth filter, 53, 67
button labels, 358

C

C13.par file, 534
calculated spectrum display, 187
calibration
decoupler pulse, 457
gradient strength, 444
shaped pulses, 81
calibration file, printing, 70
carbon
acquisition, 276, 277
automated acquisition, 89
plotting, 420, 430
process 1D carbon spectra, 89
carbon decoupler calibration macros, 67
carbon gradient ratio calibration macros, 67
carbon observe calibration macros, 67
carbon-enriched molecules, 277
Carr-Purcell Meiboom-Gill T2, 108

cartridge tape, 581
center frequencies of nD experiments, 477
center of screen display limits, 93
chained acquisition, 71
chained experiments, 97
chained study queue, 562
CHAN readout, 593
change sample experiment, 95
changing working directory, 92
channels
    assign frequencies for probe tuning, 593
    available for use, 375
    rf frequencies, 548
    rf generation on each channel, 489
    set frequency of rf channels, 518
    waveform generator on channel, 489
characters in a string, 316
chart
    maximum width, 622
    maximum width in second direction, 622
    starting position, 507
    starting position in second direction, 508
    width, 621
    width in second direction, 621
chart paper
    preprinted paper for HP plotters, 287
chemical shift offset frequency, 526
chemical shifts list, storing, 165, 405
chemist-style parameters, 86
class C amplifiers, 54, 91, 102
    decoupler high-power control, 149
    decoupler low-power control, 154
clearing
    experiment text, 115
    integral reset points, 117
cmd parameter, 388
Coarse Attenuator label, 91, 102
coarse attenuator type, 91
coef file, 515, 548
coefficient to construct interferogram, 215, 216
coefficients for digital filtering, 182, 560
Cold Probes, 115
COLOC sequence, 424
color intensity map, 295
    display, 128
    without screen erase, 132
color selection for drawing, 406
colors for plotting, 98, 526
combining arrayed 2D FID matrices, 236, 240
comm port for sample changer, 100
command execution, 204
commands
    dbsetup remove, 127
    dbupdate, 127
    display which command or macro is used, 630
    edit online description, 349
    online description, 348
    rename, 283
comparing shim sets, 150
compiling
    user PSG object library, 448
    user pulse sequences, 513
    user-written weighting functions, 637
compiling pulse sequence, 513
completed FIDs in experiment, 93
completed transients, 115
complex Fourier transform, 441, 442
complex points to left-shift ni interferogram, 336
complex points to left-shift ni2 interferogram, 337
complex points to left-shift np FID, 336
complex time-domain data points, 331, 332
compressed 2D data conversion, 225
configuration information, 635
configuration parameters
    display and possibly change, 99
Configure label, 101
conpar file, 100, 113
console hardware status, 293
Console label, 100
console parameter, 103
console type, 103
contact time, 103
continuous wave (CW) modulation, 160
contour display
    display control, 131
contour plot, 128, 404
    display, 168
    width of plotting area, 621
    without screen erase, 132
contour plot display, 169
conversion units for parameters, 598
convert a temporarily stored study into a submitted study, 644
converting
    32-bit data files to VNMR, 559
    Bruker data, 104
    compressed 2D data to standard format, 225
    data in table order to linear order, 579
    Hz or ppm to plotter units, 291
    VXR-style data to VNMR, 108
    VXR-style text files to UNIX, 618
Copy protocols in a study queue, 644
copying
    experiment data to subfile, 109
    files, 107, 108
    local file to remote host, 204
    one parameter tree to another, 269
    peak file to another file, 321
    remote file to local host, 202
    system macro to become user macro, 344
    user macro files, 342
CORBA client, 115
CORBA server, 115
corrected difference between successive spectra, 219
cosine value, 107
cosine-squared window function, 555
cost accounting, 610
COSY
    acquisition, 278
    automatic analysis and plot, 390
    automatic analysis of data, 40
    phase-sensitive, 107
    plotting, 420
COSY-like correlation spectra, 228
CPMGT2 pulse sequence, 108
create protocols macro, 557
Create study queue parameters for imaging, 557
Create study queue parameters for liquids, 110
creating
    FID display parameters, 221
    LC-NMR parameters, 396
    parameters in a parameter tree, 112

UNIX directory, 357
cross-polarization, 649
cross-relaxation, 589
CryoBay Monitor software, 115
cubic curve fitting, 56, 210
curecc file, 519
curpar file, 113
current experiment
correct parameter characteristics, 224
determine if acquisition active, 208
current FID data block, 94
current gradient coil, 249
Current study queue node id, 46
current window, 116
current working directory, 454
current-type parameter tree, 113
cursor
adjust tau2 to start of acquisition, 592
difference of two frequency cursors, 138, 139
difference of two time-domain cursors, 139
mode, 350
move cursor to center spectrum, 93
move cursor to nearest line, 368
move spectral window according to cursors, 359
reset integral to zero at cursor, 653
set decoupler frequency to cursor position, 509, 510
split difference of two cursors, 553
state in df, ds, or dconi programs, 114
cursor position, 111, 112
time domain, 113
curve fitting, 55, 209
cutoff point for VT regulation, 617
CW amplifier mode, 54
cycle phase, 108
cycled BR24 pulse sequence, 117
cycled MREV8 pulse sequence, 117
CYCLENOE sequence, 117

D

D2PUL pulse sequence, 124
DAC, converting gauss/cm value to, 224
data conversion to linear order, 579
data display mode, 158, 159
data file display in current experiment, 132
data point, determining size of a, 58
data points to be acquired, 373
data processing type on FID, 440, 441, 442
data set conversion from VXR-style to VNMR, 104, 108
data station system configuration, 575
data truncation limit, 116
data.fdf file, 241, 242
database for VnmrJ, 127
datadir directory, 630
date of data acquisition, 126
dbsetup remove command, 127
dbupdate command, 127
dc correction, 218
dc offsets removed from FIDs, 132
dconi.out file, 350
decay curves, 409
deconvolution, 218, 223
display numerical results, 540
plotting, 422
starting point, 601
decoupler
adjust tip-angle resolution time, 157
decoupling sequence, 183, 184
field strength, 155
field strength calculation, 275
fine power attenuator, 176
frequency, 142
frequency offset array, 510
frequency offset control, 164
high-power control, 149
linear modulator power, 177
low-power mode, 154
mode during status periods, 154, 155
modulation frequency, 101, 155, 156
modulation mode, 160, 161
nucleus lookup, 161
power level with linear amplifier, 174
power to switchable probe caution, 174, 175, 176
proton decoupler pulse calibration, 434
pulse calibration, 457
pulse length, 433
pulse sequence diagram, 173
set frequency to cursor position, 509
tip-angle resolution, 178
used as transmitter, 124
used for pulsing, 160
WALTZ decoupling present, 620
decoupler 2 parameter values
set from probe file, 517
decoupler modulation frequency, 156
decoupler parameter values
set from probe file, 517
def file, 164
Default button, 137
default directory for Files menu system, 136
defaultdomain file, 518, 525
defaultrouter file, 518, 525
Define excitation band, 401, 512
Define excitation band for solvent suppression, 401
delay
first, 124
incremented delay for pulse sequence, 124, 125
overhead delay between FIDs, 123
preacquisition, 53, 390
wait for another trigger, 197
wait to acquire a spectrum, 197
delay-type parameter, 112
deleting
experiments, 137
file, parameter, or FID directory, 137
files, 492
spectra from analysis, 138
user macro, 137
DEPT
acquisition, 277
analysis and plot, 391
automated complete analysis, 70
automatic analysis and spectrum editing, 51
plotting data, 421
spectra array processing, 140
dept.out file, 51
DEPTGL pulse sequence, 139
destroying

parameters, 140
parameters of a group, 140
devicenames file, 527
devicetable file, 527
dg window, 582
dg2 parameter, 147
Dgcstecosy pulse sequence, 147
Dgcstehmqc pulse sequence, 147
DgcsteSL pulse sequence, 147
dglc parameter group, 148
Dgroup of a parameter, 517
diagonal parameter arrays, 61
diagonal peaks threshold during peak picking, 643
dialog box, 103
dialog box from a macro, 149
dialog, starting a, 164, 165, 202
dialoglib directory, 164
difference between cursors in Hz, 138
difference between cursors in seconds, 139
difference NOE experiment, 117
diffusion analysis, 210
add to current display, 211
add to current plot, 407
display, 210
diffusion constant, 409
calculation, 409
diffusion experiment analysis, 56
diffusion gradient level, 250
Diffusion Ordered Spectroscopy (DOSY), 166
digital filter type, 136
digital filtering
bandwidth, 184, 560
bandwidth for oversampling, 379
coefficients for oversampling, 379
create downsampling parameters, 395
create parameters for oversampling, 398
downsampling factor, 168
file of FIR digital filter coefficients, 222
inline type, 188
number of coefficients, 182, 560
parameter creation, 49
digital lock display, 470
digital resolution measurement, 178
digitally filtered FIDs, 150, 561
dimension of experiment, 61, 89
dimensionality of experiment, 251
direct polarization, 649
directly detected dimension
absolute value display mode, 76
additive weighting constant, 78
data display mode, 158
first-order phase, 328
Fourier number, 227
Gaussian function, 257
Gaussian shift constant, 257
line broadening, 313
phase angle display mode, 389
phased spectra display mode, 410
power display mode, 455
reference line frequency, 487
reference line position, 487
scale spectral width, 508
set reference line, 491
sinebell constant, 506
sinebell shift constant, 506
spectral width, 525, 574
start of plot, 547
user-defined weighting, 636
width of plot, 631
zero-order phase, 494
directories
change working directory, 92
create new UNIX directory, 357
default for Files menu system, 136
delete, 137
display current working directory, 454
get information about files, 251
list files, 150
list files in directory, 316, 335
move directory, 363, 479
path to current experiment, 116
remote VXR-style system, 201
remove empty directories, 492
remove from experiment, 97
rename directory, 363, 479
stored queue experiments, 71
user's manual directory, 349
user's private VNMR files, 601
VNMR system, 576
disk file errors, 46
display
acquisition information, 43
lock level, 42
spinner speed, 42
temperature, 42
Display integral values, 170
display limits
set for full screen, 244
set for full screen with room for traces, 244
set for left half of screen, 315
set for right half of screen, 490
display mode for plotter, 430
Display normalized integral values, 171
display parameters
create 3D display parameters, 393
full recall of set, 231
move between experiments, 352
recall set, 464
save as a set, 503
set to full spectrum, 214
display parameters group, 146
display templates for 3rd rf channel parameters, 393
display templates for pulse sequence, 533
displaying
2D color map of 3D plane, 172
2D data interactively, 129
2D spectra in whitewash mode, 181
2D spectra in whitewash mode with no screen erase, 181
3D parameter group, 146
3D plane projection, 173
3D planes, 189
3rd/4th rf channel parameter group, 146
acquisition information, 43
acquisition parameter group, 145, 148
acquisition status information, 542
acquisition time, 212
add another diffusion analysis, 211, 407
arrayed acquisition parameters, 125
automation parameters, 148
color intensity map, 128
contour plot, 128

contour plot with screen erase, 169
contour plots, 168
create 2D parameters, 393
current working directory, 454
data file in current experiment, 132
dialog box from a macro, 149
display parameter group, 146
error messages, 203
Ethernet address, 200
experiment library, 212
experiment time, 212
exponential curves, 210
FID, 141, 142
FID as connected dots, 167
FID file in current experiment, 132
FIDs in whitewash mode, 145
FIDs of 2D experiment, 141
files in directory, 150
formatted text, 632
full window display, 639
grid on 2D display, 268
horizontal LC axis, 126
inset spectrum, 298
integral amplitudes, 170
integral with a spectrum, 180
integrals at reset points, 152
LC-NMR parameters, 148
limNET nodes, 164
line frequencies above threshold, 153
lock level, 42
log file for experiment, 212
message on acquisition status line, 40
next 3D plane, 367
normalized integral amplitudes, 170
normalized integrals, 153
parameter value, 462
parameters and their attributes, 151
peak frequencies, 169
phase file in current experiment, 133
plot is same as display, 639
plotted contours, 168
polynomial curves, 210
previous 3D plane, 437
processing parameter group, 145, 148
pulse sequence diagram, 173
pulse sequence generation errors, 448
recalculated simulated spectrum, 187
remote VXR-style directory, 201
scale under spectrum or FID, 182
set for center of screen, 93
set full screen with room for traces, 244
set limits for full screen, 244
shim method string, 185
shim parameter group, 148
spectra in whitewash mode, 196
spectrum, 180
spin simulation parameter arrays, 151
spin simulation parameter group, 147
spinner speed, 42
stacked FIDs, 143, 144, 145
stacked spectra, 189
stacked spectra automatically, 191
stacked spectra automatically with no screen erase, 192
stacked spectra horizontally, 192
stacked spectra horizontally with no screen erase, 194
stacked spectra with no screen erase, 195
strings in text window, 200
system macro file, 344
temperature, 42
text file for current experiment, 585
text file in graphics window, 196
text files, 91
time of acquisition, 212
user macro files, 342
which command or macro is used, 630
width adjustment, 658
done codes, 44
DOSY (Diffusion Ordered Spectroscopy) experiment, 166
dosyfit program, 166
dosyfrq, 166
dosygamma, 167
double-precision data acquisition, 168
double-precision VNMR FID data, 99
double-quantum filtered COSY pulse sequence, 177
downsampling
bandpass filter offset, 185
bandwidth of digital filtering, 184
creating parameters, 395
digital filter coefficients, 182
factor, 168
inline type, 188
parameter creation, 49
setting parameters, 358
dpiv, 170
dpivn, 171
dprofile, 172
DQCOSY, 177
DQCOSY experiment, 177
drawing a line between points, 177
drift correction
2D spectra traces, 128
activity flag, 128
calculation, 128
cancel, 92
group, 128
ds, 130
ds.out file, 350
DSP parameter creation, 49
DSP type (see digital filtering), 188
DSP, type of, 189
dummy scans, 559
Dynamic Angle Spinning (DAS), 126
dynamic binding, 514

E

echo command (UNIX), 200
eddy current
testing, 268
eddy current compensation
off, 200
on, 200
editing
files, 200
macros, 343
menu file, 353
parameter file with user-selected editor, 394
parameter file with vi editor, 394
UNIX text files, 606

user macro, 345
ejection of sample, 199, 201
elements, returning number of, 544
elliptical filters, 53, 67
Email address, 201
End a study queue, 556
enter.conf file, 202
enterexp file, 202
enumerated values, 112
remove from a variable, 517
Ernst angle pulse calculation, 203
errmsg file, 637
error codes, 44
error conditions recovery, 466
error during acquisition, 45, 623
error handling control, 295
error message display, 203
errors in pulse sequence generation, 448
Ethernet
address display, 200
disconnect host computer, 525
host computer connection, 518
evolution dimension
set spectral width, 532
evolution time increments, 367, 368
excitation pulse, 387
Execute a protocol from the locator, 328
Execute processing macro, 205
executing VNMR command, 204
exiting from VNMR, 208, 611
exp5 (add/subtract experiment), 48, 98
experiment data retrieval, 497
experiment directory path, 116
experiment numbers list, 349
experiment parameters, restoring, 305
experiment text file
append string, 64
clear text, 115
experiment time display, 212
experimental frequency of transition, 98
experimental lines, assigning transitions, 62
experiments
abort acquisition with no error, 276
acquire and Fourier transform, 247
acquisition time estimate, 587
action when bs transients accumulate, 621
action when error occurs, 623
action when experiment completes, 625, 626
action when nt transients accumulate, 630
add parameters, 49
add parameters for FID display, 221
append string to text file, 64
calculate dimension, 89
clear text file, 115
completed transients, 115
correct parameter characteristics, 224
correct parameter limits and step sizes, 396
create workspace, 94
delete an experiment, 137
determine if acquisition active, 208
dimension, 61
dimensionality, 251
display acquisition time, 212
display data file, 132
display FID file, 132
display log file, 212
display phase file, 133
edit text file, 586
experiment library display, 212
fit data to lineshapes, 223
get text from data file, 255
join existing experiment, 303, 304
make FID element using numeric text input, 347
move display parameters between experiments, 352
move FIDs between experiments, 354
move parameters between experiments, 359
nucleus selection, 534
number of completed FIDs, 93
parameters for basic experiment, 534
pulse sequence setup, 265
recalculate number of transients, 587
remove inactive lock and join experiment, 599
remove old files and directories, 97
replace text file, 585
resume a stopped acquisition, 465
retrieve FIDs from a file, 495
retrieve parameters from file, 496
retrieve shim coil settings, 496
save FIDs, 569
save parameters, 572
save text to a data file, 453
select 1D experiment for processing, 250
select 2D experiment for processing, 251
set up $T_{1\ experiment}$, 167
setup macro, 601
setup macros, 225
shim values to use, 322
shimming conditions, 635
solvent selection, 534
stop acquisition, 504
string parameters for storage, 365
submit Autolock experiment to acquisition, 323
submit Autoshim experiment to acquisition, 538
submit change sample, Autoshim to acquisition, 504
submit setup experiment to acquisition, 566
submit to acquisition, 65, 264
text file display, 585
expfit.out file, 407
exponential analysis, 578, 579
exponential curve, 209
exponential curve fitting, 56, 103, 210
exponential curves display, 210
exponential curves plot, 407
exponential value of number, 208
exponential weighting, 313, 314
external time base, 643
extract entries in VXR-style directory, 136
extrapolated dispersion mode, 219

F

F1 linear prediction parameters, setting, 525
f_1 scaling factor for 2D multipulse sequences, 509
f_1, f_2 display, 374
f_2 ridges, 95
f_3 processing of 3D data, 630
FDF files, 241, 242, 570
FDM program, running, 217

FID block, move, 354
FID block, reverse, 483
FID button, 264
FID data, move, 355
FID data, reverse, 486
fid file, 580
FID file, memory map open, 356
FID trace, move, 356
FID trace, reverse, 488
FID, memory map close, 355
fid.orig file, 580
FIDs
absolute-value mode data display, 159
acquisition time, 63
action after FID finishes, 631
action after last FID, 626
add to add/subtract experiment, 47
arrayed 2D FID matrices, 628, 629
automatic processing, 443
axis label units, 80
combine arrayed 2D FID matrices, 236, 240
complex points to left-shift np FID, 336
compress double-precision FID data, 99
copy FIDs into exp5 as array, 261
create display parameters, 49, 221
current data block, 94
cursor difference, 139
delete FID directory, 137
digitally filtered FID, 561
display as connected dots, 167
display FID files in current experiment, 132
display FID of 2D experiment, 141
display scale, 182
display single FID, 141, 142
display stacked FIDs, 143, 144, 145
display whitewashed FIDs, 145
filtered, 560
first point multiplier, 230
Fourier transform 1D FIDs, 233
Fourier transform 2D data, 236
Fourier transform 3D FID into 3D data, 240
hypercomplex 2D Fourier transform, 239
imaginary part display, 142
interactive display, 40
interleave FIDs during processing, 294
left-shift FID to time-domain cursor, 588
make FID element using numeric text input, 347
maximum point in an FID, 220
move FIDs between experiments, 354
noise level measurement, 371
number of completed FIDs, 93
overhead delay between, 123
plot a scale under a FID, 447
plot in whitewash mode, 408
plot one or more FIDs, 421
prepare parameters for acqi display, 256
pulse breakthrough effects, 493
remove dc offsets, 132
retrieve from a file, 495
retrieve from experiment subfile, 497
save FID data in FDF format, 570
save in current experiment, 569
solvent subtraction, 395
start of FID display, 536
subtract FID from add/subtract experiment, 567
TPPI 2D Fourier transformation, 239
type of data processing, 440
vertical position, 612
vertical position of imaginary FID, 613
vertical scale, 606
weight and Fourier transform 1D FIDs, 627
weighting interactively, 637
width of FID display, 626
write numeric text file using a FID element, 634
zero-order phasing constant, 413
field position, 654
FIFO loop size, 221
Fifo Loop Size label, 101, 221
FIFO underflow error, 46
files
append data to file, 633
automation data file name prefix, 74
Bruker data files for conversion, 559
check for existence, 205
clear a file, 632
delete, 137
delete one or more files, 492
display experiment library, 212
display in text window, 91
edit with user-selectable editor, 200
file name extension information, 252
find number of files in directory, 251
find words and lines in text file, 326
get text from data file, 255
handle interactively, 221
lines or records in file, 373
links to files, 316
list files in directory, 150, 316, 335
load parameters from file into a tree, 231
make a copy, 107
make FID files using numeric text input, 347
making a copy, 108
move a file, 479
move file, 363
plot files, 611
plot text file, 430
print or plot to a file, 438
print text files, 451, 611
put text file into another file, 453
read 32-bit data files into VNMR, 559
read Bruker data files from tape, 467
remove old files from experiment, 97
rename a file, 479
rename file, 363
retrieve FIDs from file, 495
retrieve parameters from file, 496
retrieve shim coil settings from file, 496
return information from files display, 222
save FIDs in experiment, 569
save parameters from experiment, 572
save parameters from tree to a file, 232
save shim coil settings to a file, 573
text files display in graphics window, 196
transfer file from remote source, 202
transfer files to remote destination, 204
write formatted text to a file, 632
Files menu system
default directory, 136
filter bandwidth, 216
filter delays, 53
filter diagonalization method (FDM), 217

filtlib directory, 222
Find an xml menu, 223
Find gzlvl1/gzwin button, 271
Find gzwin button, 271
fine attenuator, 591
fine attenuator configuration, 216
fine attenuator control, 176
Fine Attenuator label, 102, 176, 216, 591
fine power attenuator, 176
finite impulse response (FIR) coefficients, 222
first delay in pulse sequence, 124
first point multiplier, 230, 231
first pulse width, 387
first-order baseline correction, 588
first-order phase, 328, 329
    make zero, 90
first-order phase correction, 126
first-point multiplier, 95
fitspec.data file, 223
fitspec.inpar file, 223, 519
fitspec.outpar file, 223, 519, 540
flag-type parameter, 112
flashc command, 225
flip time, 387, 454
FLIPFLOP pulse sequence, 226
flow encoding gradient level, 257
fluorine
    automated acquisition, 214
    process 1D spectra, 215
fm-fm mode decoupling, 155
fm-fm modulation (swept-square wave), 160
folding-in problem, 216
foreground processing, 605
formatted text writing to a device, 632
formatting real number as a string, 229
Fourier number, 227
Fourier number scaled value of an integral, 297
Fourier number scaled volume of a peak, 297
Fourier transform
    1D data, 233, 627
    2D data, 234, 236, 627
    3D FID into 3D data, 240
    phase-sensitive data, 235, 239
    processing mode for 2D data, 432
fourth decoupler
    adjust tip angle resolution time, 158
    decoupler mode, 155
    decoupling sequence, 184
    frequency, 143
    frequency offset control, 165
    modulation frequency, 156
    modulation mode, 161
    nucleus lookup, 162
    power level with linear amplifier, 175
    tip angle resolution, 179
fp.out file, 103, 138, 230, 578, 579
frequency limits of region, 254
frequency of a line, 252
frequency of decoupler, 142, 143
frequency of lock, 324
frequency of rf channels, 518
frequency offset array for decoupler, 510
frequency offset for decoupler, 164, 165
frequency offset for observe transmitter, 590
Frequency Overrange label, 101, 380
frequency referencing
    2nd evolution dimension, 531
    evolution dimension, 530
    proton spectra, 134, 525, 529
frequency referencing, see reference line
frequency scale dimension adjustment, 508
frequency shift of fn spectrum, 337
frequency shift of fn1 spectrum, 337
frequency shift of fn2 spectrum, 338
frequency synthesizer latching, 313
frequency synthesizer overrange, 380
frequency synthesizer value, 452
frequency-independent phase, 412
frequency-independent term, 58
frequency-shifted quadrature detection, 232
frequency-type parameter, 112
ftr3d call name, 307
full display, 639
full screen display limits, 244
full-band amplifier, 54
full-width at half-height (FWHH), 318

G

gain of receiver, 247
gap between lines in spectrum, 248
GARP decoupling sequence, 155, 157, 160
gating time for receiver, 115, 493, 494
gauss/cm, converting to DAC value, 224
Gaussian apodization constant, 637
Gaussian fraction, 187
Gaussian fraction for lineshape, 519
Gaussian function, 257
Gaussian function shift, 637
Gaussian lineshape, 223
Gaussian shift constant, 257, 258
Gaussian time constant, see Gaussian function
Gaussian window function, 248
gcoil parameter, 249
GCU (gradient compensation unit), 267
Gemini systems
    convert data to VNMR, 104
    convert files to UNIX format, 618
    decompose files to UNIX files, 136
    list contents of directory, 201
    read tape, 581
general setup for 2D experiments, 514
generalized curve fitting to data, 209
generic automatic processing, 443
Gilson Liquid Handler window, 260
gilson.conf file, 202
global file, 113, 114
    update after VNMR install, 600
global parameter tree
    save parameters, 505
global-type parameter tree, 113
gmapz pulse sequence, 263
gmapz.par file, 263
grad_cw_coef parameter, 409
grad_p_coef parameter, 409
grad_p1 array, 410
gradient
    coil, 249
gradient autoshimming, 261
gradient calibration constant, 249, 519
gradient calibration pulse sequence, 444
gradient coil configuration, 575

gradient coil configuration file, 102
gradient coil updating, 600
gradient COSY pulse sequence, 250
gradient HSQCTOXY, 259
gradient level trim, 270
gradient map generation, 68, 69
gradient map generation, automatic, 68
gradient shape, 266
gradient shimming
  display menu, 262
  map shims, 262
  pulsed field gradient strength, 270
  set parameters, 262
  spectral width percentage, 271
  start acquisition, 261
  start gradient autoshimming, 261
  z-axis shims number, 270
Gradient Shimming System menu, 262
gradient step size, 266
gradient strength
  maximum value, 264
gradient strength for each axis, 270
gradient strengths calibration for PGE, 408
gradient total limit, 270
gradients for X, Y, and Z axes, 267
Gradients label, 101
gradtables directory, 520
graphics window
  display message with large characters, 81
  display status, 267
  display text file, 196
  draw box, 84
  write formatted text to screen, 632
Graphics Window colors, 516
graphics window, dividing into rows and columns, 520
GraphOn terminal window clearing, 97
gray scale contrast adjustment, 268
gray scale display adjustment, 268
gray scale image plot, 295
grid lines over 2D plot, 422
grid on a 2D display, 268
gripper abort, 45
Group A parameters, 147
group of parameters in tree, 520

H

H1.par file, 534
Hadamard
  tocsy experiment, 590
Hadamard transform processing, 441
Hadamard waveforms, 290
hardware Ethernet address display, 200
hardware shimming
  list of shims, 281
hardware shims, 467, 515
hardware status of console, 293
hardware values in acquisition system, 521
hardware Z1 shimming, 281
HCCHTOCSY sequence, 277
height of peak, 230
HET2DJ pulse sequence, 282
HETCOR acquisition, 277
HETCOR experiment, changing parameters for, 282
HETCOR pulse sequence, 282, 424
HETCORCP1 pulse sequence, 282
HETCORPS pulse sequence, 282
hetero2d, 282
heteronuclear 2D-J experiment, 282
heteronuclear chemical shift correlation, 282
heteronuclear J-resolved 2D spectra, 422
heteronuclear multiple-quantum coherence, 284
Hewlett-Packard plotter pens, 526
Hewlett-Packard plotters, 287, 642, 651
hiding a command, 283
High Power Amplifier Enable, 283
high-power pulse widths, calibrating, 67
Hilbert transform algorithm, 219
HMBC sequence, 424
HMQC phase-sensitive PFG pulse sequence, 259
HMQC pulse sequence, 424
HMQCR pulse sequence, 284
HMQC-TOCSY 3D pulse sequence, 284
HOM2DJ pulse sequence, 284
homo2d, 285
HOMODEC experiment, changing parameters for, 285
homodecoupling control, 285
homonuclear correlation, 107, 589
homonuclear J-resolved 2D experiment, 284
homonuclear J-resolved 2D spectra, 423
homorof1, 285
homorof2, 286
homorof3, 286
homospoil, 287
  pulse length, 289
  pulses, 287
horizontal LC axis, 126, 399
horizontal offset, 284
horizontal projection of trace, 130
horizontally stacked spectra, 192
host computer
  serial port connection to changer, 545
host computer connection to Ethernet, 518
host computer disconnect from Ethernet, 525
host disk errors, 46
hostname.le0 file, 518
hosts.3D file, 241
Hoult setting for final pulse times, 287
HSQC experiment, 288
HSQC pulse sequence, 259
hsqcHT experiment, 288
HSQC-TOCSY 3D pulse sequence, 289
HSQCTOXY, gradient, 259
htbw1, 289
htfrq1, 290
hypercomplex points to left-shift interferogram, 336

I

I1 and I2 values, 203
identifier, return for argument type, 595
idle mode for amplifiers, 54
IF Frequency label, 101
imaginary part of FID, 142
imaging
  application mode, 60
  attenuator, 92
  macros and menus, 60
Imaging Gradient Coil label, 102
imconi macro, 295

inactive parameter, 377
INADEQUATE data about 2-quantum axis, 228
INADEQUATE pulse sequence, 296
Incredible Natural Abundance Double-Quantum Transfer Experiment, 296
incremented delay for pulse sequence, 124, 125
index of experimental frequency of transition, 98
indirectly detected axis, 79
INEPT pulse sequence, 296
info directory, 515
info_# file, 409
Initialize liquids study queue, 110
inline DSP, 188
Insensitive Nuclei Enhanced by Polarization Transfer, 296
inserting a sample, 293, 298
inset spectrum, 298
integer-type parameter, 113
integral
  display, 180
  display mode, 299
  integral value, 297
  largest value in region, 298
  normalization scale, 297
  offset, 299
  regions, 287
  reset points, 653
  scale, 299
  set value, 523
integral amplitudes display, 170
integral amplitudes plot, 416
integral scale adjustment, 300
integrals
  clear reset points, 117
  data truncation limit, 116
  display in normalized format, 153
  display list, 152
  find integral values, 368
  reset point amplitudes, 316
  reset point frequencies, 317
integration, 1D spectrum, 299
intensity of spectrum at a point, 349
intensity threshold, 563
interactive acquisition display, 40
interactive phasing, 180
interactive UNIX shell, 538
interferogram coefficients, 215, 216
interferograms
  first-point multiplier, 231
  start of display, 536
  type of data processing, 441, 442
  weighting interactively, 637
  width of display, 627
  zero-order phasing constant, 414
interlock to control lock level and spin speed, 295
Internet address, 42, 43, 44
inverse cosine calculation, 39
inverse Fourier transform, 233, 234
inverse sine, 62
inverse tangent, 63
isreal, 300
isstring, 301
iterated parameters list, 302
iterations in an iterative simulation, 368

J

J-correlation experiment, 589
Join a work space from the locator, 163
joining
  an existing experiment, 303, 304
joint arrays, 61
J-resolved 2D spectrum, 228
jump-and-return sequence, 305
JUMPRET sequence, 305

K

keyboard entries record, 473
keyboard focus to input window, 228
keyboard input into variables, 296
kinetics analysis, 56, 210, 308, 309, 407

L

label a stacked spectra display, 194
lastlk file, 312
latching capabilities of frequency synthesizer, 313
Latching label, 101, 313
LC axis, 126, 399
LC-NMR
  2D acquisition parameters, 314
  create parameters, 396
  create pseudo-2D dataset, 261
  delay for trigger, 197
  display horizontal LC axis, 126
  display LC-NMR parameters, 148
  general 2D experiment setup, 315
  set up parameters for LC-NMR sequences, 315
  set up pulse sequence for LC-NMR run, 314
  set up scout run, 531
  TOCSY sequence, 315
least-squares curve fitting, 55, 209
left half of screen display limits, 315
left-shift FID to time-domain cursor, 588
left-shift ni interferogram, 336
left-shift ni2 interferogram, 337
left-shift np FID, 336
leg relay control, 316
lfs (low-frequency suppression) option, 395
limits for scales in regression, 508
limits of parameter in a tree, 523
limNET nodes database, 164
line amplitudes list, 321
line assignments for spin simulation, 96, 151
line broadening, 313, 314
line broadening factor, 638
line drawing between points, 177
line drawing capability, 358, 406
line frequencies, 321, 544
line frequencies and intensities
  display list, 153
  find values, 369
line list plotting, 425
line listing intensity and frequency, 252
line narrowing sequence, 361
linear amplifiers, 55, 102
  decoupler power level, 174, 175
  power level, 590
linear curve fitting, 56
linear fitting to data, 210

linear modulator power, 177, 591
linear monotonic order data, 579
linear prediction
  algorithm, 329, 330
  algorithm data extension, 332, 333
  arraying parameters, 332
  calculation start point, 525, 564, 565
  coefficients to calculate, 331
  create parameters, 397
  data extension, 330, 331
  data extension start point, 564
  multiple operations, 332
  number of data points, 331, 332
  output spectrum, 335
  parameter creation, 49, 50
  print output, 333, 334
  printout, 333
  type of data processing, 441, 442
linearly spaced array values, 60
line-narrowing multiple-pulse, 86
lines of text, look up from a text file, 326
lineshape modification, 519
linewidth for spin simulation, 544
linewidth measurement, 178
Load experiment from protocol, 556
Load experiment from protocol (M), 109
load time counter, 643
local file transfer to remote host, 204
local host name display, 200
local oscillator (L.O.), 325
location of sample in tray, 323
location to start a line, 358
Locator action, 323
lock
  acquisition time constant, 323
  automatic control, 53
  automatic phase adjustment, 323
  capture, 53
  digital lock display, 470
  frequency, 524
  gain value, 325
  interactive, 40
  lock frequency adjustment, 324
  lock parameters setup, 524
  loop time constant, 325
  phase value, 325
  power value, 325
  read current lock level, 470
  remove inactive lock, 599
  solvent selection, 546
  solvent used, 312
  time constant, 325
lock file, 605
lock frequency
  track changes, 317
Lock Frequency label, 101, 324
lock level display, 42
lock level interlock, 295
log file, 212
log file for experiment, 212
logarithm of a number, 321
login macro, 84
loop size of fifo, 221
Lorentzian lineshape, 223, 519
low-band amplifier, 54
low-pass digital filter, 395
lpanalyz.out.# file, 333, 334

M

maclib directory, 84, 112, 137, 344, 473
Macro to create protocols, 110
Macro to perform generic 2D plot, 110
Macro to save study queue parameters, 111
Macro to set weighting functions from a panel, 111
macros
  activated by VNMR bootup, 84
  automatic execution, 528
  before experiment starts, 247
  change action of abort command, 38
  check for existence, 205
  copy system macro to become user macro, 344
  copy user macro file, 342
  create without text editor, 112
  delete user macro, 137
  display dialog box, 149
  display system macro, 344
  display user macro in text window, 342
  display which macro is used, 630
  edit online description, 349
  edit user macro with vi editor, 345
  edit with macro editor, 343
  hide command with same name, 283
  keyboard entries, 473
  list system macros, 345
  list user macro file names, 343
  load macro into memory, 343
  name of invoking macro, 342
  name storage for macros, 365
  online description, 348
  real-value storage parameters, 465
  remove macro from memory, 453
  remove system macro, 345
  remove user macro from directory, 344
  restore normal abort function, 38
  return values to calling macro, 482
  terminate calling macro, 37
  terminate execution, 482
magic angle spinning, see MAS
magnet leg relay control, 316
magnetization recovery, 124
Make Shimmap button, 262
makeuser command, 600
manual directory, 349
map shims, 262
MARK button, 350, 351
mark output, 601
mark1d.out file, 62, 350, 550, 601
mark2d.out file, 85, 350
MAS cross-polarization spin-lock contact time, 103
MAS spinning speed, 558
Max. Narrowband Width label, 168
Max. Spectral Width label, 101
Maximum DMF label, 101
maximum frequency of any transition, 544
Maximum gradient DAC value, 266
maximum gradient strength for each axis, 270
maximum of two spectra, 554
maximum parameter value array, 397
maximum transients accumulated, 363
mean of the data in regression.inp file, 433
measured line frequencies, 544

measured line frequencies array, 550
memory buffers, write to disk, 226
memory increased by removing macros, 453
memory map FID file, close, 355
memory map open FID file, 356
memory usage statistics, 362
Menu On button, 353
menulib directory, 222, 353
menus
    button command string, 362
    change status of menu system, 353
    edit menu with vi editor, 353
    label for button, 358
    menu displayed by Return button, 313
    return currently active menu, 366
    select menu without activation, 366
message
    confirm using mouse, 103
    display with large characters, 81
messages from send2Vnmr, 317
method string, 563
microimaging
    gradient calibration constant, 519
    refocusing pulse shape, 455
    shape of excitation pulse, 388
minimum frequency of any transition, 545
minimum intensity threshold, 563
minimum of two spectra, 554
minimum parameter value array, 398
MLEV-16 decoupling sequence, 155, 157, 160
mode for n-dimensional data display, 591
modulation frequency of decoupler, 155, 156
modulation mode for decoupler, 160, 161
mouse
    confirming a message, 103
moving
    files, 363, 479
    parameters between experiments, 359
    spectral window according to cursors, 359
    transmitter offset, 359
MQCOSY pulse sequence, 360
MREV8 pulse sequence, 117, 361
multidimensional data display mode, 591
multihost processing, 242, 243
multiple receivers
    add transformed data files with weighting, 493
    number of receivers, 374
    set filter bandwidth, 361
    set gain, 362
    weighting for different receivers, 466
multiple-pulse line narrowing, 86, 361
multiple-quantum filtered COSY, 360, 589
multipulse experiments
    f_1 scaling factor, 509
    scaling factor, 508

N

name of pulse sequence, 513
name storage for macros, 365
natural logarithm of number, 321
negative intensities, setting 2D, 658
ni interferogram
    number of complex point to left shift, 336
    type of data processing, 441
ni2 interferogram
    type of data processing, 442
    zero-order phasing constant, 414
node files, 203, 204
nodes file, 203, 204
NOE experiment, 117
NOESY
    parameter set, 264
    plotting spectra, 420
NOESY 1D experiment, 371
NOESY experiment, 371
noise level estimate, 254
noise level in spectrum, 372
noise level of FID, 371
noise modulation, 160
noise multiplier, 372
normalized integral amplitudes, 170
normalized integral amplitudes plot, 416
normalized integrals display list, 153
normalized intensity mode, 370
nt array, 410
N-type display, 374
nucleus for decoupler, 161, 162
nucleus for observe transmitter, 588
nucleus selection, 534
nucleus to add to probe file, 49
nuctables directory, 161
number of increments of evolution time, 367, 368
Number of RF Channels label, 101, 375
Nyquist frequency, 294

O

object library for PSG, 448
observe nucleus transmitter frequency, 537
offset
    horizontal, 284
    integral, 299
    vertical, 612
offset frequency
    calculate for nucleus and ppm, 526
online description of command or macro, 348
    edit description, 349
open reel tape, 581
Operating system account owner, 382
Operator name, 378
oph real-time variable, 108
order of parameter array, 61
out.c file, 106
overhead delay between FIDs, 123
overrange of frequency synthesizer, 380
oversampling
    bandwidth, 379
    factor for acquisition, 381
    filter type, 380
    number of coefficients, 379
    parameter creation, 49, 398
    setting parameters, 358
Oxford shim supply, 539
Oxford VT controller, 351
Oxford-Sorenson VT controller, 351

P

page change on plotter, 391
par directory, 534

Index

parameter directory
delete, 137
parameter list
parameter names and values, 392
plotting, 434
parameter panel
enable or disable, 644
parameter sets
correct saved parameter sets, 599
file name of retrieved set, 221
update all sets in directory, 599
parameter tree
copy parameters of group, 269
create new parameter, 112
destroy parameters of a group, 140
display parameters with attributes, 151
limits of parameter, 523
load parameters from file into a tree, 231
make parameter active, 377
make parameter inactive, 377
prune extra parameters, 446
remove a parameter, 140
set Dgroup of a parameter, 517
set group of parameter, 520
set values of string parameter, 517
systemglobal-type tree, 100
types of trees, 113
value of parameter, 535
write parameters to file, 232
parameters
3rd rf/3D parameter group, 146
4th rf channel parameter display group, 146
acquisition/processing group, 145
add for FID display, 221
add parameter to probe file, 50
add to current experiment, 49
adjust values from setup macros, 225
adjusting, 305
adjusting plot, 304
arrayed for acquisition, 125
arraying order and precedence, 61
automation parameter group, 148
basic experiment setup, 534
boxed for plotting, 86
change type, 533
check existence, 205
chemist-style, 86
convert to PGE, 408
copy between trees, 269
correct limits and step sizes, 396
correct parameter characteristics, 224
create 2D parameters, 393
create 3D parameters, 393
create 4D acquisition parameters, 393
create for fourth channel, 224, 225
create for linear prediction, 397
create for third rf channel, 224
create LC-NMR parameters, 396
create new parameter in tree, 112
create oversampling parameters, 398
create parameters for 2D peak picking, 397
create solvent subtractions parameters, 395
customize parameter sets, 601
destroy a parameter, 140
destroy parameters of a group, 140
display control, 57
display from tree with attributes, 151
display parameters group, 146
display templates for third rf channel, 393
display values in text window, 200
displaying value, 462
downsampling, 395
edit parameter and its attributes, 394
full recall of display parameters, 231
full spectrum display, 214
get value, 256
gradient shimming, 262
limits of parameter in tree, 523
linearly spaced steps, 61
list to be iterated, 302
lock parameters setup, 524
make parameter active, 377
maximum values, 397
minimum values, 398
move between experiments, 359
move display parameters between experiments, 352
plot list automatically, 57
plot on special chart paper, 287
prepare for acqi, 256
print all, 57
protection mode, 527
prune parameters from tree, 446
pseudo-echo weighting, 447
read from file and load into tree, 231
recall display parameter set, 464
reset after partial 3D FT, 481
resolution enhancement, 481
restoring current experiment, 305
retrieve from experiment subfile, 497
retrieve from file, 496
retrieve individual parameters from file, 497
retrieve parameter from probe file, 253
save display parameters as set, 503
save from experiment, 572
save from tree to file, 232
save parameters from global tree, 505
set group of parameter in tree, 520
set up for pulse sequences, 448
set up standard two-pulse sequence, 504
shims parameter group, 148
sine window function, 542
sinebell weighting, 543
sine-squared window function parameter values, 543
spin simulation parameter arrays, 151
spin simulation parameter group, 147
spin system parameters to iterate, 296
step size values, 398
system configuration, 99
test state of parameter, 377
turn off active parameter, 377
types of values, 112
unit conversion, 598
update after new VNMR install, 600
value of parameter in tree, 535
VAST experiment parameter setup, 604
version of parameter set, 399
parlib file, 448
paths
2D planes from a 3D data set, 399
current working directory, 454

VNMR system directory, 576
VNMR user directory, 601
Pbox
add parameter definition to pbox.inp file, 404
assign Pbox calibration data, 457
convert to Pbox default units, 404
converts to default units, 404
create Pbox shape file, 109
create shape definition, 459
define excitation band, 401, 512
define excitation band for solvent suppression, 401
display interactive modulation pattern, 185
display interactive pulse shape, 185
display last generated pulse shape, 184
display modulation pattern, 184
display pulse shape, 184
extract dmf value, 401
extract dres value, 402
extract fine power level, 403
extract name of last shape, 402
extract power level, 402
extract pulse length, 402
generate a single-band shapefile, 458
open shape definition file, 378
plot modulation pattern, 449
plot pulse excitation profile, 435
plot pulse shape, 449
plot the last created pulse shape, 449
print pulse header, 435
reset temporary pbox/Vnmr variables, 404
simulate Bloch profile for a shaped pulse, 458
write a wave into file, 453
write wave definition string, 535
pbox
write wave definition string, 535, 537
pbox shape file, 109
pcss.outpar storage file, 165, 405
peak frequencies display, 169
peak frequencies plot, 434
peak frequencies threshold, 586
peak height or phase measurement, 230
peak heights comparison, 52
peak noise, 254
peak number, 315
peak picking, 318
diagonal peak threshold, 643
parameters creation, 397
plot results, 425
peak printout threshold, 586
peak search range of data points, 373
peak truncation in spectra plot, 417
peak width of solvent resonances, 545
peak, selecting, 568
peaks.bin file, 321
peak-to-peak noise, 372
pens
maximum number to use, 352
on HP plotter, 526
selection for drawing, 406
Perform gradient shimming utility functions (M), 110
Performa I, II, III, 102
Performa modules, 267
PFG
absolute-value MQF COSY pulse sequence, 264
absolute-value ROESY pulse sequence, 270
amplifiers on/off control, 407
eddy current testing, 268
gradient calibration constant, 519
HMQC phase-sensitive pulse sequence, 259
HMQC pulse sequence, 258
HSQC pulse sequence, 259
NOESY parameter set, 264
selective excitation pulse sequence, 512
sequence for PFG testing, 388
TNNOESY pulse sequence, 269
pge file, 408
PGE pulse sequence
calibrate gradient strengths, 408, 410
extract data, 409
parameter conversion, 408
plot results, 409
print results, 409
processing of data, 409
phantom for gradient calibration, 519
phase angle display mode, 158, 389
phase correction applied to interferogram, 126
phase cycling type, 412, 413
phase file
display in experiment, 133
phase of first pulse, 412
phase of peaks, 230, 412
phase parameters
automatic calculation of, 58
phase-correction angles, 328, 494, 495
phased data display mode, 158
phased spectra display mode, 389, 410, 411
phase-sensitive 2D transformation, 328
phase-sensitive COSY pulse sequence, 107
phase-sensitive data, 235, 239, 628, 629
phasing
automatic, 58
control update region, 413
phosphorus
acquisition, 388
processing, 388
spectrum plotting, 430
pi/3 shifted sinebell squared window function, 414
pi/4 shifted sinebell squared window function, 415
pl2dj macro, 426
planes
extract from 3D spectral data, 253
Plot 2D arguments, 430
Plot Design, joining, 303, 304
plot parameters
adjusting, 304
plot queue
show jobs in queue, 541
stop jobs and remove from queue, 307
plots, 409
plotter
characteristics, 527
device setup, 428
display mode, 430
Hewlett-Packard, 642
maximum number of pens, 352, 526
maximum width of plotting area, 622
plot contours, 404
reinitializing, 307
resolution of points drawn, 435

show plot queue, 541
stopping plot jobs, 307
submit plot and change plotter page, 391
write formatted text to plotter, 632
plotter units
converted from Hz or ppm, 291
Plotters color, 516
plotting
2D contour plots for 3D planes, 429
2D displayed resolution, 62
2D peak picking results, 425
2D spectra in whitewash mode, 418
arrayed 1D spectra, 419
ATP-type spectra, 419
axis label units, 79
boxed parameters, 86
carbon spectrum, 420
color assignments, 98, 526
contour plot with colors, 404
contours display, 168, 169
COSY data set automatically, 390
COSY spectra, 420
deconvolution analysis, 422
DEPT analysis, 391
DEPT data, 421
display same as plot, 639
draw box, 84
exponential curves, 407
FIDs, 421
FIDs in whitewash mode, 408
files, 611
formatted text, 632
grid on 2D plot, 422
heteronuclear J-resolved 2D spectra, 422
homonuclear J-resolved 2D spectra, 423
horizontal LC axis, 399
limit to center of page, 93
line list, 425
NOESY spectra, 420
non-arrayed 1D spectra, 426
noninteractive gray scale image, 295
parameter list, 392, 434
parameter list on special paper, 287
parameters automatically, 57
peak frequencies over spectrum, 434
PGE calculated results, 409
phosphorus spectrum, 429
plotter characteristics, 527
polynomial curves, 407
proton spectrum, 422
pulse sequence, 436
scale below spectrum or FID, 447
set full page plot with room for traces, 244
set limits for full page plot, 244
spectra, 417
spectra automatically, 426
spectra in whitewash mode, 432
spectral expansion, 52
start of plotting position, 507
start of plotting position in second direction, 508
text file, 430
X,H-correlation 2D spectrum, 424
plotting area, see chart
plotting scaling factor, 291
point-by-point, 554
polarization transfer experiments, 139
polynomial curve, 209
polynomial curves display, 210
polynomial curves plot, 407
polynomial fitting of baseline, 82
Postscript printer, 642
powder pattern
finding the center, 553
power data display mode, 158
power level for decoupler with deuterium decoupler, 175
power level for decoupler with linear amplifier, 174, 175
power level of transmitter, 590
power spectra display mode, 455, 456
power, setting, 527
ppm calculations, 475
ppm of solvent resonances, 545
preacquisition delay, 390
precedence of parameter array, 61
presat 1H experiment, 437
Presat experiment processing, 647
print queue
show jobs in queue, 541
stop print jobs and remove from queue, 308
printcap entry, 611
printer
device setup, 438
linewidth resolution, 435
maximum width of chart, 622
resolution in dots/mm, 435
send text to printer, 438
start print operation, 438
stopping print jobs, 308
type, 611
write formatted text on printer, 633
printing
color assignments, 98, 526
parameters, 57
PGE calculated results, 409
probe file after autocalibration, 39
starting, 438
text file, 451
text files, 611
printing area, see chart
probe
phase glitch removal, 226
tuning, 363, 461, 581
tuning frequencies, 593
type, 439
probe directory, create new, 51
probe file, 39, 49, 526
add parameter, 50
retrieve parameter, 253
set decoupler parameter values, 517
update, 600
probe file, copying, 70
probe file, create new, 51
probe file, make copy, 70
probe gcal calibration macros, 68
probe protection control, 440
probe, copying, 70
probe, editing, 440
probeConnect, 439
procdat file, 515
processed-type parameter tree, 113

processing
1D carbon spectra, 89
2D spectra, 442
3D data processing information, 515
arrayed 1D spectra, 443, 562
create 2D parameters, 393
create 3D processing parameters, 393
DEPT spectra array, 140
FIDs automatically, 443
fluorine 1D, 215
generic automatic, 443
interleave FIDs, 294
phosphorus 1D spectra, 388
proton 1D, 275
select 1D experiment for processing, 250
selected 2D experiment, 251
simple 1D spectra, 441
solvent subtraction events, 395
processing mode for 2D data, 432
processing on FID, 440
processing on the interferogram, 441, 442
processing parameters group, 145
procpar file, 99, 113, 599
procpar3d file, 515
procpar3d parameter set, 367, 515
programmable pulse modulation, 160
project 2D data onto axis, 444
projection plane, 173
protection mode of parameter, 527
proton
acquisition, 276, 277
automatic acquisition, 274
spectra processing, 275
spectra vertical scale adjustment, 615
spectrum plotting, 422, 430
proton acquisition, 277, 278
proton chemical shifts spectrum
calculating, 165
calculating and showing, 405
reducing to a list, 165
proton decoupler
pulse calibration, 434
proton decoupler calibrations, 68
proton frequency configuration, 275
Proton Frequency label, 100, 275
proton gradient ratio calibration macros, 67
proton observe calibration macros, 69
proton parameter set, getting, 66
Proton prescan, 287
protune macro, 445
ProTune shell script, 446
protunegui, 446
pseudo-2D, 604
pseudo-2D dataset, 261
pseudo-echo weighting, 447
psg directory, 513
PSG errors, 448
PSG message, 37
PSG object library compilation, 448
psg.error file, 448
psglib directory, 513
PTS frequency synthesizer, 101, 452
P-type diagonal, 228
P-type double-quantum axis, 228
pulse amplifier
mode, 54
phase glitch removal, 226
pulse breakthrough effects, 493
pulse interval time, 456
pulse length of decoupler, 433
pulse power for shaped pulse, 452
pulse sequence
compiling, 513
display diagram, 173
initiate compilation, 513
label for screen, 449
name to be used, 513
phase-sensitive COSY, 107
plotting a picture of a sequence, 436
set up parameters, 448
setup macro, 265
Pulse Sequence Controller board, 494
pulse sequence generation, see PSG
pulse sequences
display templates, 533
pulse width in degrees, 387, 454
pulse width length, 454
pulse width of first pulse, 387
pulse width optimum value, 203
pulsed field gradient strength, 270
pulse-type parameter, 112
pulsewidth, setting, 527
pure absorptive display, 239
pwwet pulse width, 625
pwx1 parameter, 457

Q

quadratic fitting to data, 56, 210
quadrature detection
frequency shifted, 232
quadrupole echo pulse sequence, 559
question mark (?) notation, 462

R

real Fourier transform, 441, 442
real number formatted into string, 229
real number, returning square root of a, 558
real numbers, truncating, 592
real variable
create real variable without value, 471
real-time digital filter, 380
real-time DSP (digital filtering), 188
real-type parameter, 112
real-value storage for macros, 465
receiver
channel imbalance, 108
gain, 247
gating time, 115, 493, 494
overflow warning, 45
receiver option, 200-kHz, 168
recon_all, 471
recording current window activity, 306
recording keyboard entries, 473
Recover from acquisition error in study queue, 649
Recover from error conditions during automation study, 646
REDOR1 pulse sequence, 474
reference deconvolution, 218
reference frequency

position, 476, 477
reference line
clear referencing, 114
frequency, 487, 488
position, 487
reference frequency, 475
set line, 491, 492
reference peak, see reference line
reference spectrum to TMS, 588
refocusing pulse shape, 455
regions
divide spectrum into regions, 478
find tallest peak, 405
frequency limits of specified region, 254
in spectrum, 375
plot expansions, 52
selection, 287
region-selective 3D processing, 451
regression analysis data input, 490
regression mode, 55, 56
regression mode curve fitting, 209
regression scale limits, 508
regression.inp file, 211, 433, 490
RELAY-COSY pulse sequence, 478
RELAYH pulse sequence, 478
release procedure, 362
remote file transfer to local host, 202
remote machine name, 42, 43, 44
removing
dc offsets, 132
directories, 492
files, 492
user macro, 344
renaming a command, 283
renaming files, 363, 479
reset points for integrals, 117
Reset study queue parameters, 111
resetting acquisition computer, 38
resolution enhancement function, 313, 314
resolution enhancement parameters, 481
resolution equalization, 62
resolution on printers and plotters, 435
restorenuctable, 482
Retrieve a parameter set from the locator, 163
Retrieve a shimset set from the locator, 163
Retrieve and process fid data from the locato, 163
retrieving
FIDs, 495
parameters, 496
Return button selection of menu, 313
rf band in use, 483
rf channel selection, 484
rf channel type, 485
rf channels available, 375
rf channels frequencies, 518, 548
rf generation type, 489
rf pulse shape analysis, 452
rf waveform generator, 489
ridges in FID display, 230
right half of screen display limits, 490
right phase parameter, 495
right phase-correction angles, 494
ROESY experiment, 493
ROESY parameter set, 270
Roesy1D, 493
root-mean-square noise, 254, 372
rotating 2D data, 494
rotating frame NOE experiment, 589
rotating frame Overhauser experiment, 493
rotating frame Overhauser experiment, 1D, 493
rotational echo double-resonance, 474
rotor speed display, 289
rotor synchronization, 289
configuration parameter, 494
spinning rate, 558
Rotor Synchronization label, 101, 289, 494
RS-232 cable, 45
Run an experiment to find the value of z0 (M), 110
Run prepare acquisition macro, 436
running FDM program, 217

S

s2pul3rf parameter set, 393
sample
change for acquisition, 95
ejection from probe, 199, 201
insert in probe, 293, 298
location of samples in tray, 323
spin rate, 549
submit change sample experiment to acquisition, 504
temperature, 390, 582
sample changer
automation mode active, 69, 71
automation run preparation, 69
change sample experiment, 95
comm port, 100
controlling, 70
controlling macro for automation, 70
errors, 45
last lock solvent used, 312
resume suspended automation run, 75
serial port connection, 545
starting automation run, 71
status window, 562
suspend automation run, 75
tray size, 592
Sample Changer label, 100, 592
Sample Changer Serial Port label, 545
sample information for automation run, 202
Sample Management System serial port connection, 545
sample tray size, 100
sampleinfo file, 70
save study parameters for imaging, 558
saving
data, 569
digitally filtered FIDs, 150
display parameters, 503
experiment data to subfile, 573
FID data in FDF format, 570
FIDs in current experiment, 569
files using a base name, 505
parameters from current experiment, 572
parameters to file, 232
shim coil settings, 573
text file into another file, 453
scale below spectrum or FID, 182, 447
scale limits in regression, 508
scale spectral width, 508, 509
scaling constant, 363

scaling factor for multipulse experiments, 508
scaling factor for plots, 291
scaling factors, 78
scan in progress, 116
scout run, 531
screen display set for center, 93
SCSI errors, 46
second decoupler
  acquisition parameters, 146
  adjust tip-angle resolution time, 157
  decoupler mode, 154
  decoupling sequence, 183
  fine power attenuator, 176
  frequency, 142
  frequency offset array, 510
  frequency offset control, 164
  linear modulator power, 177
  modulation frequency, 156
  modulation mode, 160
  nucleus lookup, 162
  power level with linear amplifier, 174
  pulse sequence diagram, 173
  set frequency to cursor position, 509
  tip-angle resolution, 179
second delay, 124
selected widths, setting, 533
Selective 1D experiments Apptype macro, 511
selective excitation experiment, continuing, 568
selective excitation pulse sequence, 512
selective frequencies, setting, 533
selective inversion, setting up, 533
selexHT, 512
send command to VNMR, 513
Seq label on screen, 449, 513
seqfil file, 174
seqgenmake file, 513
seqlib directory, 212, 513
serial port connection, 545
serverport, 514
Set colors for Graphics Window, 516
set colors for Plotter, 516
Set Default button, 137
Set initial state for multiple viewports, 612
Set parameter bits for use with protocols, 518
Set Params button, 544
sethtfrq1, 521
settune, 533
setup experiment, 566
setup macros, 225
sf wf button, 536, 626
shape of an excitation pulse, 387
shape of refocusing pulse, 455
shaped observe excitation sequence, 537
shaped pulse analysis, 452
shaped pulse calibration, 81, 452
shapeinfo file, 81, 452
shapelib directory, 81, 183, 184, 452, 457
shared amplifier type, 54
shell on UNIX, 537, 538
Shifted Laminar Pulses (SLP), 314
shifted sinebell squared window function, 414, 415
shim coil settings, 471
  retrieve from file, 496
  save to file, 573
shim gradient, 642, 650, 651, 652, 654, 655, 656, 657, 658
shim method string creation, 366
shim method string display, 185
shim parameters group, 148
shim set type, 538
shim supply, 539
shim values comparison, 150
shim values used, 322
shimmap calculations, 271
shimmethods directory, 185, 353
shimming
  automatic shimming conditions, 635
  Autoshim method, 353
  errors, 46
  interactive, 40
  Z1 hardware, 281
shims
  list of, for hardware shimming, 281
  read all shims, 467
  set all shims, 515
Shimset label, 101, 538
sidechain assignments, 277
signal-to-noise ratio, 545, 583, 584
  estimate, 254
  maximum, 186
  measurement, 186
sine value of angle, 542
sine window function values, 542
sinebell constant, 506
sinebell shift, 638
sinebell shift constant, 506, 507
sinebell squared window function, 414, 415
sinebell time period, 638
sinebell weighting parameters selection, 543
sinebell-squared window function, 558
sine-squared window function, 543
SIS (12 bit) gradients, 102
skyline projection, 444
software preparation date, 483
software revision level, 483
solids
  adjust tau2 to current cursor position, 592
  cross polarization spin-lock experiments, 56
  cross-polarization spin-lock analysis, 210
  echo pulse sequence, 559
  f_1 spectral width scaling factor, 509
  first pulse phase, 412
  MREV8 multiple-pulse experiment, 361
  multiple-pulse line narrowing, 117
  rotor speed display, 289
  rotor synchronization module, 494
  scaling factor for multipulse experiments, 508
  solid-state echo pulse sequence, 559
  solid-state HETCOR sequence, 282
  spinning speed for MAS, 558
  VT controller in use, 351
solvent resonances ppm and peak width, 545
solvent selection, 534
solvent subtraction
  create parameters, 395
  filter bandwidth for filtered FID, 560
  order of polynomial to fit digital filtered FID, 561
  parameter creation, 50
solvent suppression, 237
  number of peaks for wet, 625
solvent table information, 546

solvents file, 534, 546
solvent-suppressed region, 560
sparse FID data points, 167
Specify action when experiment is done
    commnad, 622
    parameter, 622
spectra
    3D dc correction, 548
    absolute value display mode, 76
    add spectrum to add/subtract experiment, 547
    APT plotting, 419
    automatic 1D integrate, 299
    automatic phase, 58
    automatic phase adjustment, 58
    center cursor, 93
    data truncation limit, 116
    deconvolution, 223
    delete spectra from $T_{1\ or\ T2\ analysis}$, 138
    display calculated spectrum, 187
    display scale, 182
    display single spectrum, 180
    divide spectrum into regions, 478
    drift correction calculation, 128
    drift correction parameters, 92
    extract planes from 3D spectral data, 253
    find gap in spectrum, 248
    find peak heights or phases, 230
    find tallest peak in region, 405
    fold COSY-like correlation spectra, 228
    fold J-resolved 2D spectrum, 228
    frequency shift of spectrum, 337, 338
    frequency-independent phase, 412
    full display, 214
    horizontal offset of each spectrum, 284
    inset spectrum display, 298
    integral amplitudes display, 170
    integral amplitudes plot, 416
    integral regions, 287
    intensity of a spectrum at a point, 349
    interactive display, 41
    move cursor to center, 93
    move spectral window according to cursors, 359
    noise limit, 372
    normalized integral amplitudes display, 170
    normalized integral amplitudes plot, 416
    normalized intensity mode, 370
    number of regions, 375
    offset of integral, 299
    peak frequencies display, 169
    peak height comparison, 52
    peak search range of data points, 373
    phase adjustment, 58
    phase angle display mode, 389
    phased display mode, 389, 410, 411
    phosphorus processing, 388
    phosphorus spectrum plot, 429
    plot a scale under a spectrum, 447
    plot arrayed 1D, 419
    plot COSY automatically, 420
    plot NOESY automatically, 420
    plot one or more spectra, 417
    plot peak frequencies, 434
    plot spectra in whitewash mode, 432
    power spectra display mode, 455, 456
    processing simple 1D, 441
    proton spectrum plotting, 422
    reduce spectral width to minimum, 357
    reference line frequency, 487
    reference line position, 487
    reference to TMS, 588
    rotate 2D spectrum, 494
    select spectrum without displaying, 511
    signal-to-noise estimate, 254
    signal-to-noise test, 584
    solvent-suppressed region, 560
    spectral integral display and plot, 299
    stacked spectra display, 189, 191, 192, 194, 195
    subtract spectrum from add/subtract experiment, 555
    threshold for integrating 2D peaks, 586
    total width to be acquired, 574
    update region during phasing, 413
    vertical offset in stacked display, 612
    vertical position, 612
    vertical scale, 613
    whitewash mode display, 196
spectra, taking maximum of two, 554
spectral expansion automatic plot, 52
spectral subtraction, 555
spectral width, 574, 575
    percentage for gradient shimming, 271
    reduce to minimum, 357
    set for given spectral window, 532
    set in 2nd evolution dimension, 532
    set in evolution dimension, 532
spectrometer proton frequency, 275
spectrometer system configuration, 575
spectrum, plotting on side, 428
spectrum, plotting on top, 428
spectrum, plotting on top and side, 429
spin rate of sample, 549
spin setup experiment, 549
spin simulation
    clear line assignments, 96
    deconvolution start point, 601
    display group of parameters, 147
    index of experimental frequency, 98
    intensity threshold, 563
    linewidth, 544
    maximum frequency of any transition, 544
    measured line frequencies, 544
    measured line frequencies array, 550
    minimum frequency of any transition, 545
    number of iterations, 368
    parameter arrays, 151
    parameters to be iterated, 302
    perform spin simulation, 552
    set parameters to iterate, 296
    spin system entry, 554
    transition amplitude, 97
    transition frequency, 98
    transition number, 96
    using deconvolution as input, 223
    vertical scale, 573
spin speed interlock, 295
spin system
    enter values for spin simulation, 554
    restoring to before last run, 597
spini.inpar file, 597
spini.la file, 151, 152

spini.savela file, 597
spin-lock contact time, 103
Spinner Control window, 551
spinner errors, 45
spinner speed display, 42
spinning speed for MAS, 558
spins.list file, 552
spins.outdata file, 187
Spinsight data, 496
spinsys directory, 296
spline fitting of baseline, 82
split difference between two cursors, 553
spoiler gradient level, 269
square root, returning, 558
square wave mode decoupling, 155, 160
SSECHO pulse sequence, 559
SSECHO1 pulse sequence, 559
stacked display width, 621
stacked FIDs, 143, 144, 145
stacked plot of 2D spectra, 181, 418
stacked spectra display, 189, 191, 192, 194, 195
stacked spectra horizontal offset, 284
stacking control, 562
stacking mode, 561
standard 2-pulse sequence, 387, 504
standard application mode, 60
standard deviation of input, 77
start of FID display, 536
start of interferogram, 536
start of plot, 547
Start the night queue, 648
starting
    VNMR directly, 608
starting Plot Designer, 303
static binding, 514
stdpar directory, 534
steady state pulses, 559
Step Size label, 102, 590
step size parameter value array, 398
stopping acquisition, 504
stored data, style, 104
stored queue, 71
streaming tape, 581
strength of pulsed field gradient, 270
string
    format for output, 229
    length in characters, 316
    select substring, 567
    text window display, 200
string parameter values, 517
string variable creation, 563
string-type parameter, 112
Study identification, 565
Study parameters, 565
study queue
    delete nodes, 644
    experiment manager utility macro, 643
    find next prescan or next experiment, 645
    get attributes, 645
    initialize imaging study, 645
    make new node, 645
    move node up and lock it, 645
    perform action, 643
    perform action for walkup, 643
    read node attributes, 646
    retrieve parameters, 646
    run prescans, 646
    show data from node, 647
    submit sample(s) to, 648
    update the time, 648
    write node attributes, 649
    write node order, 649
Study queue file menu commands, 556
Study queue mode, 556
Study queue prescan, 437
study queue, reset parameters for imaging, 557
Study status, 566
Study time, 566
subfile, 109
substring selected from a string, 567
subtracting zero-frequency components, 395
sum of input, 78
sum of squares of input, 78
sum/difference spectrum, 48
summing projection, 444
sum-to-memory error, 46
Sun display, clear window, 97
swept-tune graphical tool, 363, 461, 581
switchable probe caution, 149, 174, 175
synchronous decoupler mode, 154
Synthesizer label, 101, 452
synthesizer value, 452
syshelppath global parameter, 60
sysmaclibpath global parameter, 60
sysmenulipath global parameter, 60
system configuration parameters, 99
system console type, 103
system macros
    copy system macro to become user macro, 344
    display in text window, 344
    list system macro names, 345
    online description, 348
    remove system macro, 345
system type configuration, 575
System Type label, 100, 103, 575
systemglobal directory, 113
systemglobal parameter tree, 100
systemglobal-type parameter tree, 113

T

T_1 analysis, 210
    delete spectra, 138
    plot curves, 407
    set up parameters, 167
T_1 analysis, 56
T_1 analysis, 578
t_1 dimension, 336
T_2 analysis, 210
    delete spectra, 138
    plot curves, 407
T_2 analysis, 56
T_2 analysis, 579
t_2 dimension in, 337
tablib directory, 579
tangent value of angle, 580
tapes
    device selection, 581
    display contents, 580
    rewind tape, 581
taps in digital filter, 560
tau2 adjustment, 592

Tcl script, 582
tdelta parameter, 250
tdiff parameter, 250
temperature calculation curve, 583
Temperature Control window, 582
temperature display, 42
temperature interlock, 587
temperature of sample, 582
temperature regulation, 618
terminating
    abort function in macro, 38
    calling macro, 37
Test acquire mode, 583
testing signal-to-noise of spectrum, 584
text file
    display for current experiment, 585
    edit file, 586
    edit with vi text editor, 606
    editor, 200, 606
    graphics window display, 196
    plotting, 430
    print text files, 451, 611
    put into another file, 453
    search for words and lines, 326
    write file using a FID element, 634
text output sent to printer, 438
text window
    display files, 91
    display status, 585
    display strings and parameter values, 200
    display user macro, 342
    list files, 150
tflow parameter, 257
third decoupler
    adjust tip-angle resolution time, 157
    decoupler mode, 155
    decoupling sequence, 183
    fine power attenuator, 176
    frequency, 142
    frequency offset array, 510
    frequency offset control, 165
    linear modulator power, 177
    modulation frequency, 156
    modulation mode, 161
    nucleus lookup, 162
    power level with linear amplifier, 175
    set frequency to cursor position, 510
    tip-angle resolution, 179
threshold for integrating peaks in 2D spectra, 586
threshold for peak printout, 586
threshold for printout of peak frequencies, 586
time constant for lock, 325
time constant for lock acquisition, 323
time counter, 643
time-domain cursor position, 113, 592
time-domain cursors, 139, 588
time-domain dc correction, 218
time-domain solvent subtraction, 395
tip-angle resolution for decoupler, 178, 179
tip-angle resolution time for decoupler, 157, 158
TMS reference, 588
TNCOSYPS sequence, 589
TNDQCOSY sequence, 589
TNMQCOSY sequence, 589
TNNOESY parameter set, 269
TNNOESY sequence, 589
TNROESY sequence, 589
TNTOCSY sequence, 589
TOCSY experiment, 589
tocsy experiment, Hadamard encolded, 590
TOCSY pulse sequence, 236, 240, 628, 629
tof parameter, 317
total correlation (TOCSY) experiment, 589
traces
    find maximum intensity, 406
    select trace without displaying, 511
transients completed, 115
transients setpoint action, 630, 631
transients to be acquired, 373
transition amplitude, 97
transition calculation, 62
transition frequency, 98, 544
transition number calculation, 96
transitions frequency, 545
transmitter
    fine power, 591
    frequency of observe nucleus, 537
    frequency offset for observe transmitter, 263, 590
    linear modulator power, 591
    local oscillator (L.O.) gate, 325
    move transmitter offset, 359
    nucleus of observe transmitter, 588
    positioning, 590
    power level with linear amps, 590
    pulse sequence diagram, 173
    transmitter frequency, 142, 143
transmitter frequency, 142
tray size on sample changer, 592
trigger signals to wait before acquisition, 374
trim gradient level, 270
triple-quantum filtered 2D MAS experiment, 126
TROESY pulse sequence, 592
truncating real numbers, 592
truncation limit, 116
TUNE INTERFACE unit, 593
tunemethod, 594
tuning the probe, 593
Type of Amplifier label, 54, 102
type of parameter, 533
Type of RF label, 101, 485, 489

U

U+ H1 Only decouplers, 485
Ultra 8 shim configuration, 597
Ultra•nmr shim system, 471, 539
ultra18, 597
ultra8, 597
unit conversion for parameters, 598
UNIX shell startup, 537, 538
unlocked experiment, 599
unshifted cosine-squared window function, 555
unshifted Gaussian window function, 248
unshifted sinebell-squared window function, 558
update VnmrJ database, 127
updating
    gradient coil, 600
updating revision global file and parameters, 600
Upper Limit label, 102, 590
Use Console Data button, 100
user macros

copy file, 342
copy system macro to become user macro, 344
create without text editor, 112
delete, 137
display in text window, 342
edit with vi text editor, 345
library, 112
list user macro file names, 343
remove user macro from directory, 344
user-defined weighting, 636
users currently on the system, 620
user-selectable editor, 343
user-supplied modulation, 160
user-written weighting functions, 637
usrwt.o file, 637

V

value of parameter in a tree, 256
variable temperature, see VT
Varian shim supply, 539
VAST accessory, 604
VAST data analysis, 98
VAST experiments, setting up initial parameters for, 604
VAST microtiter plate, 98
version of parameter set, 399
vertical offset, 612
vertical position, 612
FID, 612
imaginary FID, 613
vertical projection of trace, 130
vertical scale adjustment, 614, 615
vertical scale adjustment, automatic, 614
vertical scale for 2D displays, 614
vertical scale for projections and traces, 616
vertical scale for simulated spectrum, 573
vertical scale for spectrum, 613
vertical scale of FID, 606
vi command (UNIX), 200, 606
vi text editor, 345, 353, 606, 608
Viewport layout, 306
viewport, set state to three default viewports, 613
viewports, set new, 613
VNMR
background processing, 605
exiting, 208
exiting from system, 611
start VNMR application directly, 608
style of stored data, 108
system directory, 576
updating parameters and global file after install, 600
user directory, 601
vnmr_textedit file, 394
vnmr_vi file, 394
vnmraddr parameter, 231
vnmreditor variable, 200, 394
VnmrJ, 609
software preparation date, 483
software revision level, 483
VnmrJ database, 127
VnmrJ database, updating, 127
VnmrJ network listening port, 514
vnmrsystem variable, 576
vnmruser variable, 601
VT Controller label, 101, 617
VT controller type, 617
VT cutoff point, 617
VT errors, 45
VT FAILURE message, 618
VT regulation light, 587
VT system in use, 351
VT wait time, 618
VXR-style directory
decompose to UNIX files, 136
VXR-style systems
convert data to VNMR, 104, 108
decompose files to UNIX files, 136
read tapes, 580
remote directory display, 201
VXR-style text files
conversion to UNIX format, 618

W

w command (UNIX), 620
walkup automation, 620
WALTZ decoupling present, 620
WALTZ decoupling sequence, 155
WALTZ-16 modulation, 160
warning error codes, 45
water suppression, 84, 305, 589
waveform generator, 489, 537
decoupling, 178
pulse interval time, 456
test, 627
waveform generator decoupling, 179
Waveform Generator label, 102, 489
weight and Fourier transform
1D data, 627
2D data, 628
along $f_{2\ \text{for 2D data}}$, 627
phase-sensitive data, 628, 629
weight.h file, 637
weighting
constant, 78
interactive weighting, 637
interactive weighting for 2D absorptive data, 638
user defined, 636
weighting function compilation, 637
wet 1H experiment, 624
WETDQCOSY pulse sequence, 624
WETGCOSY pulse sequence, 624
WETGHMQCPS pulse sequence, 624
WETGHSQC pulse sequence, 624
WETNOESY pulse sequence, 625
WETPWXCAL pulse sequence, 625
WETTNTOCSY pulse sequence, 625
WFG (waveform generator), 267
WFG + GCU gradients, 102
what you see is what you get, 639
whitewash mode, 408, 418, 432
whitewash mode display, 145, 181, 196
who is using system, 620
wideline systems data precision, 168
width of chart, 621
maximum width, 622
maximum width in second direction, 622
second direction, 621
width of FID, 626

width of interferogram, 627
width of plot, 631, 632
wildcard characters, 492
window
    current, 116
window activity, 306
windows
    clearing a window, 97
word lookup in text file, 326
Work space
    labels for all viewport buttons, 305
    numbers of all viewports, 303
    numbers of the current viewports, 305
workspace for VNMR experiment, 94
write out memory buffers, 226
Write sample enterQ entry for study queue
    automation, 646
    imaging, 647
wtlib directory, 637
wtune, 638

X

X Axis, Y Axis, Z Axis label, 102, 267
X,H-correlation 2D spectrum, 424
X1 shim gradient, 642
X2Y2 shim gradient, 642
X3 shim gradient, 642
X4 shim gradient, 642
XL systems
    convert data to VNMR, 104
    convert files to UNIX format, 618
    decompose files to UNIX files, 136
    list contents of directory, 201
    read tape, 581
xmtune, 648
XPOLAR1 pulse sequence, 649
XY shim gradient, 650
XY32 decoupling sequence, 155, 160
XZ shim gradient, 650
XZ2 shim gradient, 650
x-zero position of Hewlett-Packard plotter, 642

Y

Y1 shim gradient, 651
Y3 shim gradient, 651
Y4 shim gradient, 651
YZ shim gradient, 651
YZ2 shim gradient, 652
y-zero position of Hewlett-Packard plotter, 651

Z

z0 calibration, automatic, 66, 68
Z0 field position, 654
Z0, automatic adjustment, 68
Z1 shim gradient, 654
Z1C shim gradient, 654
Z2 shim gradient, 654
Z2C shim gradient, 655
Z2X2Y2 shim gradient, 655, 656
Z2X3 shim gradient, 655
Z2XY shim gradient, 655
Z3 shim gradient, 655
Z3C shim gradient, 655
Z3X shim gradient, 655
Z3X3 shim gradient, 656
Z3XY shim gradient, 656
Z3Y shim gradient, 656
Z3Y3 shim gradient, 656
Z4 shim gradient, 656
Z4C shim gradient, 656
Z4X shim gradient, 656
Z4X2Y2 shim gradient, 657
Z4XY shim gradient, 657
Z4Y shim gradient, 657
Z5 shim gradient, 657
Z5X shim gradient, 657
Z5Y shim gradient, 657
Z6 shim gradient, 657
Z7 shim gradient, 657
Z8 shim gradient, 658
z-axis shims used for gradient shimming, 270
zero-filling, 227, 482
zeroing phase, 115
zero-order baseline correction, 338
zero-order phase, 494, 495
zero-order phasing constant, 413, 414, 495
zero-order term automatic phase, 58
zfs (zero-frequency suppression) option, 395
ZX2Y2 shim gradient, 658
ZX3 shim gradient, 658
ZXY shim gradient, 658
ZY3 shim gradient, 658